ENGINEERING AND MINING JOURNAL

A McGRAW-HILL PUBLICATION

AUGUST 1958

PRICE ONE DOLLAR

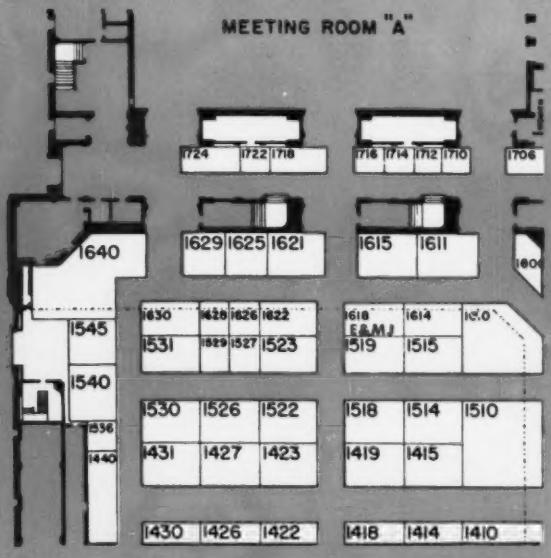
FOUNDED 1866

PRE-SHOW ISSUE

AMC — San Francisco
September 22-25

NEW EQUIPMENT can help you modernize, cut costs .... p 89

YOU'LL BE IN the loveliest city in the U.S. See Food & Fun in San Francisco..... p 113



PLAN YOUR VISITS to the exciting displays with the complete layout on ..... p 86

THE SESSIONS will cover the newest and most vital interests of industry ..... p 83

97% acceptance

Panel property of
Northspan Uranium Mines, Ltd.

Spanish-American Mine of Northspan Uranium Mines, Ltd.

that's the record of A-S-H pumps at the four huge new properties of the Rio Tinto Group in Ontario's Elliot Lake region, self-styled "Uranium Capital of the World"

Plant under construction — Milliken Lake Uranium Mines, Lt

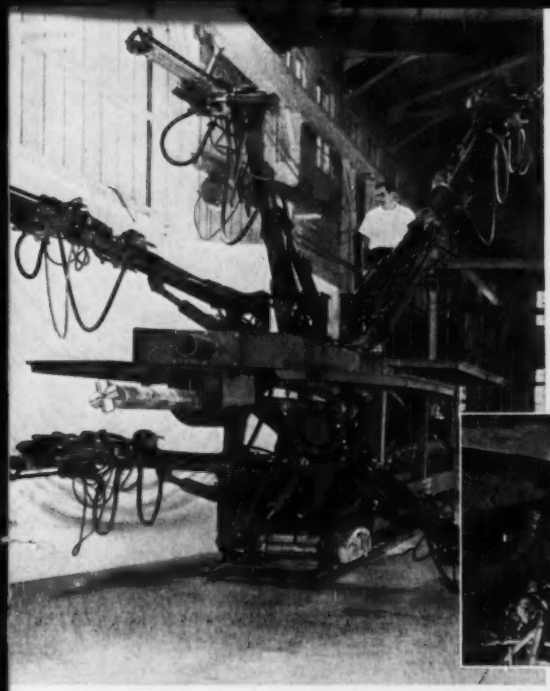
Lake Nordic Mine of Northspan Uranium Mines, Ltd.

Yes, Hydroseal and Centriseal interchangeable rubber-lined pumps, and Hydroseal Vertical Sump pumps were selected for their economical efficiency in practically all slurry applications. Rubber-lined, all-metal, gland water or no gland water, and combinations of these flexible factors of the A-S-H line enable our engineers to solve tough pumping problems. Write us.

Photographs by courtesy of
Rio Tinto Management Services, Ltd.

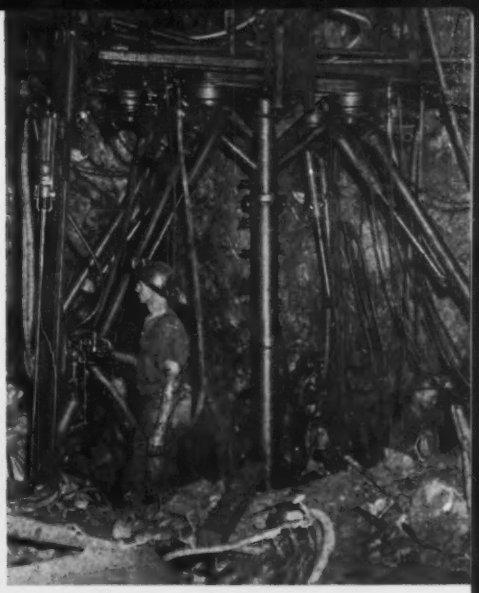
THE ALLEN-SHERMAN-HOFF PUMP CO.
Dept. B—259 E. Lancaster Ave., Wynnewood, Pa.
Representatives throughout the World

HYDROSEAL and CENTRISEAL
SAND, SLURRY & DREDGE PUMPS
MAXIMIX RUBBER PROTECTED



HYDRA-BOOM JUMBOS convert set-up time into drilling time. There's no job too big or too complex. Let our engineers help solve your unusual drilling problems.

SEND FOR BULLETIN NO. 4196



SHAFT JUMBOS. I-R Hydra-Boom Shaft Jumbos save set-up time, drilling time and manpower on big vertical shaft jobs.

SEND FOR BULLETIN NO. 4188

A CONSTANT STANDARD OF QUALITY
in everything you need for drilling rock

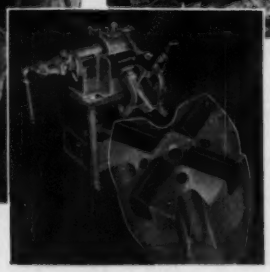
Ingersoll-Rand 5-831

Branch offices in major cities, home office, 11 Broadway, New York City

AMERICAN MINING CONGRESS, San Francisco, September 22-25
Visit Our Booth 522-526-532, Plaza Exhibit Hall

NEW DUSTLESS STOPER. Light-weight, short-leg design with built-in suction and pressure discharge of cuttings. Ideal for clean, low-cost roof bolting.

SEND FOR BULLETIN NO. 4195



UNIVERSAL JACKDRILL The easiest-handling one man universal drilling unit obtainable; converts quickly to Stoper or Jackhamer drill.

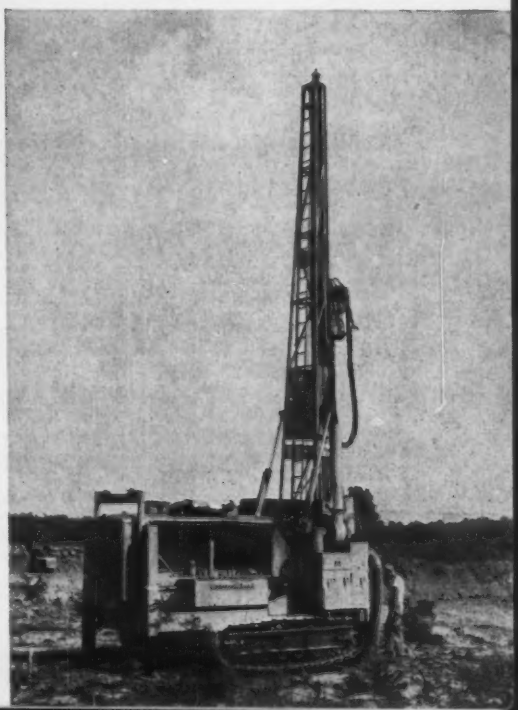
SEND FOR BULLETIN NO. 4144A

CARSET BITS AND SHOP EQUIPMENT . . . a complete line of Carset Bits, bit and rod shop equipment.

SEND FOR BULLETINS NO. 4146, 4187

DRILLMASTER. The most versatile and productive blast-hole drilling unit ever developed—completely self-powered and self-propelled.

SEND FOR BULLETIN NO. 4179



MAXIMIX RUBBER PROTECTED

ENGINEERING AND MINING JOURNAL

92nd YEAR OF PUBLICATION

AUGUST 1958

VOL. 159 NO. 8

Behind the By-Lines .. 4

E&MJ Outlook 17

This Month in Mining . 18

Washington Impact .. 20

Markets 22

New Products Digest .. 41

Operating Ideas 120

Personals 130

New U.S. Patents 134

Plan for 1959—Modernize Now—For Growth and Profits 81

American Mining Congress Annual Meeting September 22-25—San Francisco, Calif.

Technical Sessions and Speakers 83

Guide to Equipment Booths 86

Modern Equipment to Cut Your Costs 89

Food and Fun in San Francisco 113

Rio de Oro Develops for Production 126

Carl Coash .....Publisher

Alvin W. Knoerr .....Editor

Donald C. McGraw Jr. ....Advertising Sales Mgr.

Daniel P. Eigo .....Managing Editor

John B. Huttl .....Associate Editor San Francisco

Lloyd E. Antonides ....Associate Editor

James W. Franklin ....Associate Editor

Finn B. Domaas .....Assistant Editor

George H. Cleaver .....Market Editor

John R. O'Connell Jr. ..Assistant Editor Markets

F. Alvin Zimmerli .....Art Director

Ellen F. Kalhaus .....Copy Editor

John Donaldson ..Washington Bureau, Natural Resources

Alan E. Adams ....Washington Bureau, Labor

William H. McNeal ..Circulation Mgr.

Raymond H. Smalley ....Business Mgr.

News Bureaus: Atlanta 8; Cleveland 15; Detroit 26; Houston 25; San Francisco 4; Washington 4.

World News Bureaus: London, Bonn, Paris, Rio de Janeiro, Mexico City, Beirut, Tokyo, Melbourne. **World News Offices:** Stockholm, Manila, Buenos Aires, Caracas, Havana, Lima, Santiago, Montreal, Toronto, Vancouver, Johannesburg.

Published monthly with an additional issue in Mid-June by McGraw-Hill Publishing Co., Inc., James H. McGraw (1860-1948), founder. Publication Office: 3rd & Hunting Park Ave., Philadelphia 40, Pa. See panel below for directions regarding subscription or change of address.

Executive, Editorial, Advertising and Subscription Offices: McGraw-Hill Building, 330 West 42nd St., New York 36, N. Y. Donald C. McGraw, president; Joseph A. Gerardi, executive vice president; L. Keith Goodrich, vice president and treasurer; John J. Cooke, secretary; Nelson Bond, executive vice president, publications division; Ralph B. Smith, vice president and editorial director; Joseph H. Allen, vice president and director of advertising sales; A. R. Venezian, vice president and circulation coordinator.

Subscriptions are solicited only from executive management, engineering, operating and supervisory officials associated with companies engaged in the exploration, mining, milling, smelting, refining and processing of metals and nonmetallic minerals except coal, oil and stone. Position and company connection must be indicated on subscription orders. Send to address shown in box below.

Subscription rates for individuals in the field of the publication: United States and possessions $4 a year; $6 for two years; single copy $1. Canada $5 a year; $8 for two years; single copy $1. Other Western Hemisphere and Philippines $8 a year; $12 for two years; $16 for three years; single copy $2. Elsewhere $15 a year; $25 for two years; $30 for three years; single copy $2.

Entered as second class matter May 24, 1951 at the Post Office at Philadelphia, Pa., under the Act of March 3, 1879. Title registered in the U. S. Patent Office.

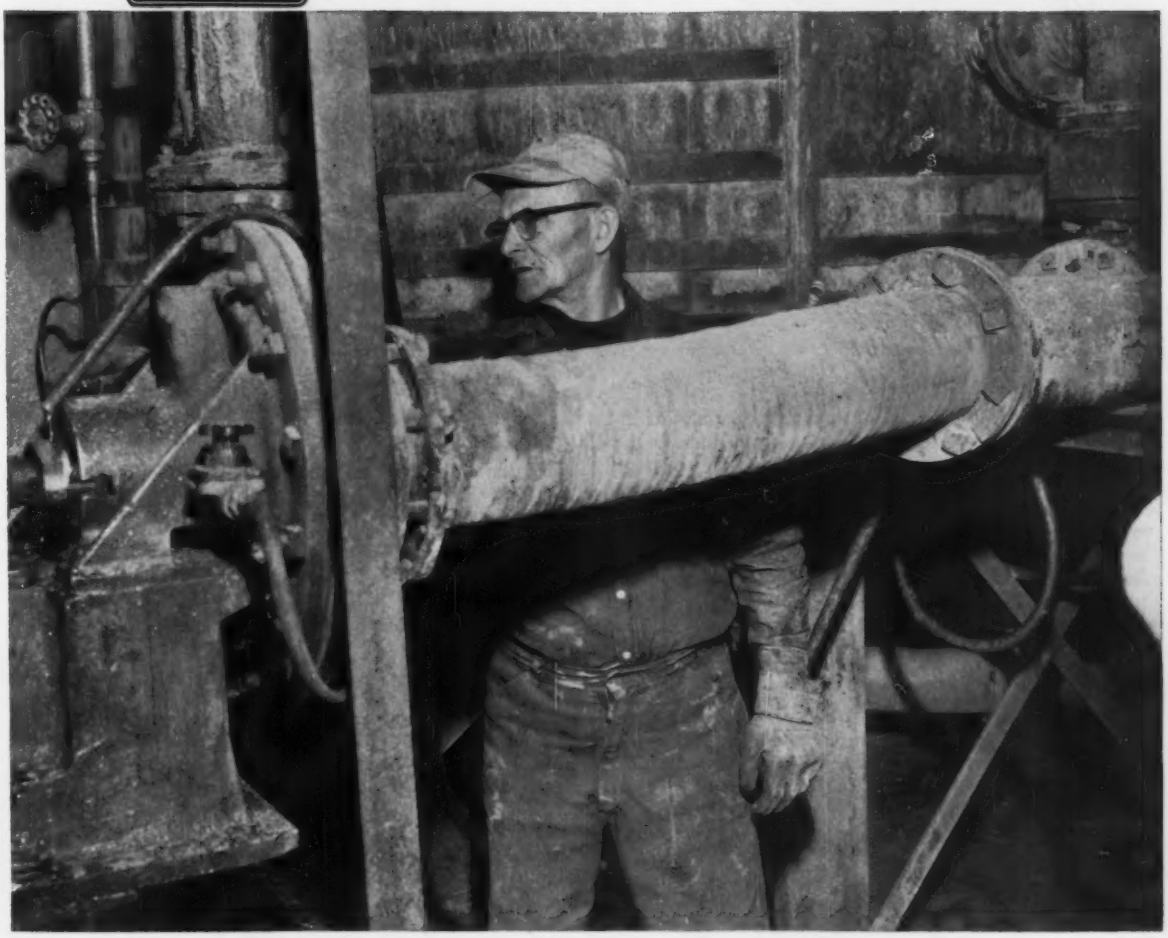
© Copyright 1958 by McGraw-Hill Publishing Co., Inc. All rights reserved. Printed in the U.S.A.

Our primary aim is to provide subscribers with a useful and valuable publication. Your comments and suggestions for improvement are encouraged and will be most welcome. The publisher, upon written request from any subscriber to our New York office, agrees to refund the part of the subscription price applying to copies not yet mailed.

SUBSCRIPTIONS: Send subscription correspondence and change of address to Fulfillment Manager, ENGINEERING & MINING JOURNAL, 330 West 42nd Street, New York 36, N. Y. Subscribers should notify Fulfillment Manager promptly of any change of address, giving old as well as new address, and including postal zone number, if any. If possible, enclose an address label from a recent issue of the magazine. Since copies are addressed one or two issues in advance, please allow one month in sending notice for the change to become effective.

Postmaster: Please send form 3579 to Engineering and Mining Journal 330 W. 42nd St., New York 36, N. Y.

B.F.Goodrich



Bang, rattle, shake— pipes were cracking up

B. F. Goodrich improvements in rubber brought extra savings

Problem: That powerful pump at left draws hot acid at 400 gallons a minute from tanks, then shoots it through big pipes. The pump vibration shook the pipes until they clanged, rattled and shivered, gradually cracked, leaked, lost corrosive acid that damaged equipment. Pipes had to be replaced two or three times a year.

What was done: The plant superintendent, working with a B.F.Goodrich distributor, decided to replace a short length of lead pipe between the tank and pump with a B.F.Goodrich Flexseal Connector. This is a special kind of hose, made of thick, resilient rubber, which is designed to absorb the pump vibrations traveling along pipelines.

Savings: At a cost of only $105, this B.F.Goodrich hose saved the company $1,000 in the first year by eliminating the harmful shaking that caused broken connections, frequent repairs, costly pipe replacements. Even greater savings will be made because the sturdy, acid-resisting hose is expected to last another two years. A coil of round steel wire, buried in the hose, keeps it from collapsing even under powerful suction.

Where to buy: Your B.F.Goodrich distributor has exact specifications for the B.F.Goodrich hose described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Company, Dept. M-379, Akron 18, Ohio.*

B.F.Goodrich *industrial products*

Behind the By-Lines...

Our old friend the beachcomber was kindly disposed when we told him that this issue was to be devoted to the American Mining Congress Show in San Francisco, Sept. 22-25, and its program.

A veteran of many such affairs, he's been compiling a file of the strategy, techniques and survival equipment and has graciously given us complete access to it.

Here, more or less in the order in which the file spilled across the floor, are his points and admonitions:

1) Don't try to do it all the first day. This applies equally to technical sessions, equipment booths and ingesting of the bubbly. Get ahold of a good guide to the meeting (this issue, for instance) and plan your coverage of the Show. There will be certain sessions you'll want to attend, certain pieces of equipment you're particularly interested in, and a given amount of time which you'd like to devote to relaxation. Plan for all of them.—And figure on spending a good part of the first day just meeting old friends.

2) Hang onto your program. The material on p 88 was the latest our good friends at AMC could get to us, but there might have been some last minute changes. Incidentally, AMC has done its best to avoid conflicting sessions, so you shouldn't have any trouble. (Since we have to cover all of 'em, we asked the boss for permission to take along a secretary of our acquaintance. That blur you'll see between Meeting Room "A" and Meeting Room "B" will be us. The secretary's staying here.)

3) When covering the equipment show, remember some of the statistics involved:

a) When entering a trade show hall, about 85% of the people go to the right, unless they are deliberately deflected. Fool 'em. Go left, or down center, or outside first, and then work your way to the right side of the hall after the crowd has moved on.

b) Most halls have concrete floors. Some of the booths will have carpeting, but you'll be on the concrete most of the time. Our friend the beachcomber makes it a point to pack along some comfortable shoes and a pair or two of white woolen socks.

c) The manufacturers' people at the booths want you to stop in and ask questions. (The notes are a little blurred here, but it looks like "blonde at Grxlmiopew booth—wrong question.")

4) Plan to see some of San Francisco by day. It's the loveliest and most fascinating town in the world, and well worth your time. Try to see the Japanese garden in Golden Gate Park; Seal Rocks; Telegraph Hill and the Embarcadero.—And sophisticates aside, you haven't really flavored the town 'til you've been to Fisherman's Wharf and the Top of the Mark.

For the top places for lunch, dinner, etc., see "Food and Fun in San Francisco," on p 113. The pages are perforated in that section of this issue, so you can tear 'em out to carry along on the trip.

The list was compiled by a group of fortunates who inhabit the Golden City and is to be trusted completely. If you should happen to get a bad meal at one of the spots named, go out and ask a cop. It's either an imposter running a Greasy Spoon or you've somehow gotten mixed up and landed in Los Angeles.

Incidentally, San Franciscans go to lunch at 12:15. You take it from there.

5) The beachcomber has a traveling gimmick you might find handy. In this world of wash and wear, he travels light and carries a supply of granulated soap in those little pay envelopes that used to convey your weekly $27.50; just enough in each envelope for a hotel sink full of wash. Happy dunking!

We've received a note from Jack Baragwanath that forces us to divulge one of the best kept secrets of all time.

> Dear Sir:
> I note on page 19 of the current *E&MJ* (July) that a search was made in Southern Rhodesia for beryl oil which led to the discovery of emeralds. I know what a beryl of oil is, but "beryl oil", as far as I'm concerned, is a new and rare substance.
> Sincerely,

We knew we couldn't keep it quiet much longer, try as we might. All right, AEC; okay, Mayo Clinic; fire away, National Research Council; shoot, Confidential magazine—we'll tell all.

Beryl oil is a new reagent that we've been working on in our secret underground laboratory for eight years now. Beryl is ground to minus 800 mesh, screened, magnetically separated, flash roasted, floated, dried and mixed with stale beer. After ageing, it is directly applied to the cranial cover of news editors. Tests are, of course, incomplete, but in our forthcoming paper, "Some Aspects of the Use of Beryl Oil Under Controlled Conditions and During a Full Moon," we note that the brain of one such subject was expanded from the size of a pea to that of a walnut.

Ambrosia Lake (see last month) just keeps popping. The Uranium Institute of America took a flying trip through there just a while ago and our man Cadwallader went along. Unfortunately, we couldn't get it into the July write-up in time, so his Rio de Oro story had to be held over for four glorious weeks.

It's here now, and well worth your perusal, back on pages 126 and 127.

Rally 'round, men, we've got a new leader. The beleaguered, but annoyingly league-leading, Casey Stengel of the New York Yankees made an appearance last month before a Congressional committee.

The Anti-Trust and Monopoly subcommittee wanted to dig into the players' views toward the business of baseball and invited Ted Williams, Stan Musial and Mickey Mantle along with Mr. Stengel.

Ol' Case led right off with a looping pitch that never touched Congressional wood. Sen. Estes Kefauver, subcommittee chairman, asked Stengel "Why does baseball want this bill passed?"

Case wound up and delivered as follows: "I would say I wouldn't know, but I imagine to keep baseball going as high as baseball is a sport that has gone into baseball from a baseball angle."

For an industry like ours, Stengel seems an excellent choice to send to Washington. He talks their language.

"BIGGEST" OPEN PIT OPERATION IS HANDLED BY CAT MACHINES

Cat DW21 (Series C) Tractor with Athey PR21 Wagon removing overburden in an open pit copper mine in Northern Rhodesia. Their speed and power make them fast, dependable producers.

With a spread that includes 26 of all types of Cat machines—working the largest open pit copper mining operation in Africa—a mining company in Northern Rhodesia is excavating 600,000 tons of earth and ore per month.

This owner has purchased Caterpillar machines because of their ability to keep going 23 hours a day (one hour required for servicing)—with a minimum of down time. A matched fleet of Cat DW20 (Series E) and DW21 (Series C) Tractors with Athey Trailers spearheads the job, and has the speed, guts and capacity that add up to a low cost-per-cu.-yd. figure.

Cat wheel-type Tractors have always had the rimpulls and fast-cycle potential to enable owners anywhere to meet production dates at an operating profit. Now new DW21 (Series D) and DW20 (Series F) Tractors are available. They feature the new Cat Super-Turbo Engine—that produces 320 HP (maximum output) and 28% torque rise!

Athey Trailers feature low center of gravity and plenty of ground clearance for excellent roadability. And both the Caterpillar and Athey units have the built-in dependability to get the job done without costly lay-ups for major overhaul.

Remember, your operators and mechanics prefer Cat machines. End result is: greater efficiency—high production from your crews.

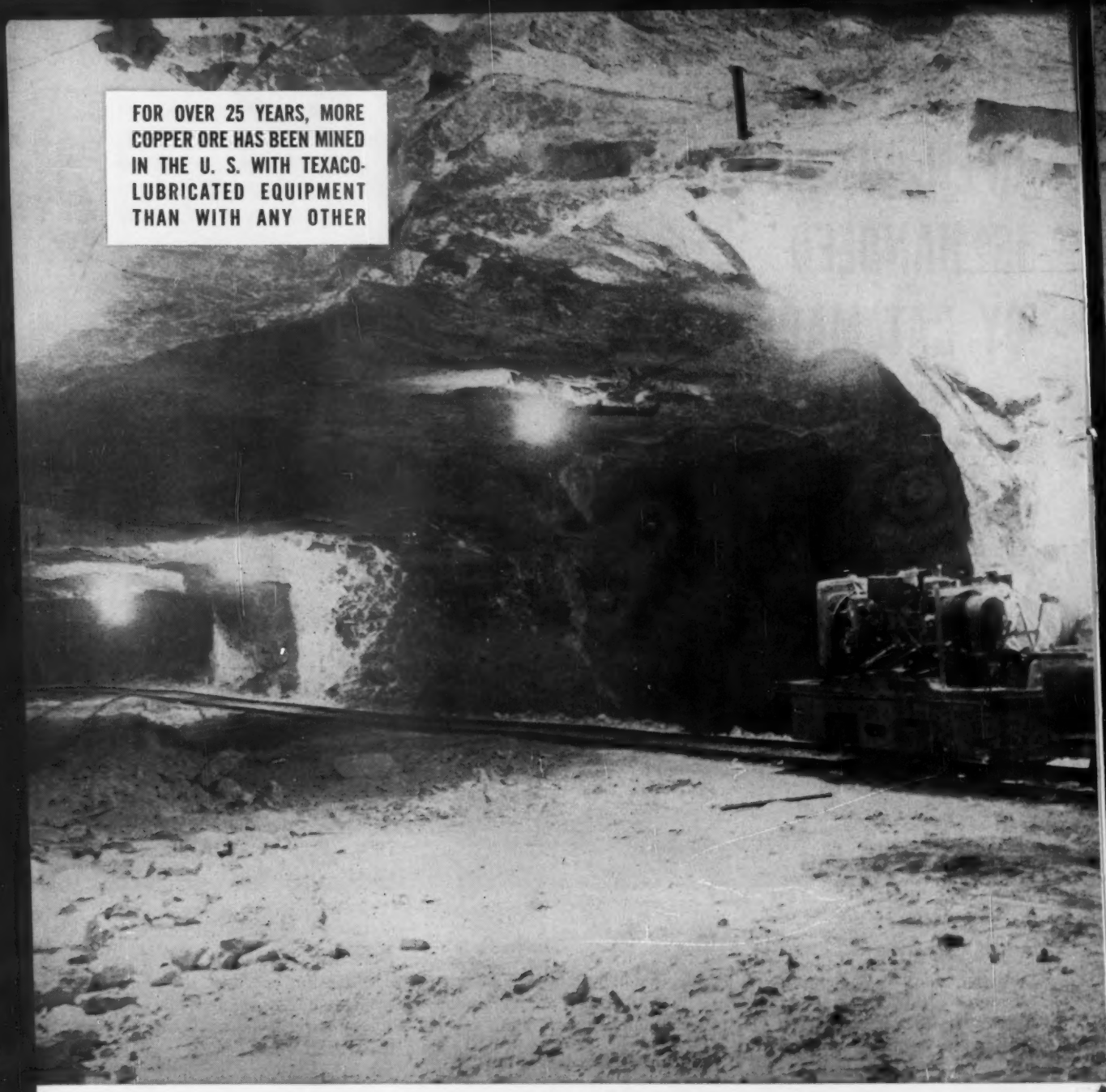
Get in touch with your Caterpillar Dealer TODAY for a demonstration. He will explain why resale and trade-in values stay high. Standardize with Cat machines; stand to make more profit on the job.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE ONLY COMPLETE TRACTOR-TRAILER LINE... BY THE LEADERS



Get "springtime starts" all year round

TEXACO OLYMPIAN GREASE won't thick up in winter, thin out in summer—gives trains the same easy starts 12 months a year

You don't have to strain your engines getting trains started on a cold winter day—or worry about grease oozing out in summer. Special properties of Texaco Olympian Grease keep it at the right consistency all the time. Furthermore, it has a high resistance to oxidation, and won't separate in service or in storage. It's bound to give longer life to your bearings.

For your wire rope and open gears, use Texaco Crater or (for spray application) Texaco Crater X Fluid. They protect both strands and core, keep wire rope strong longer. They cush-

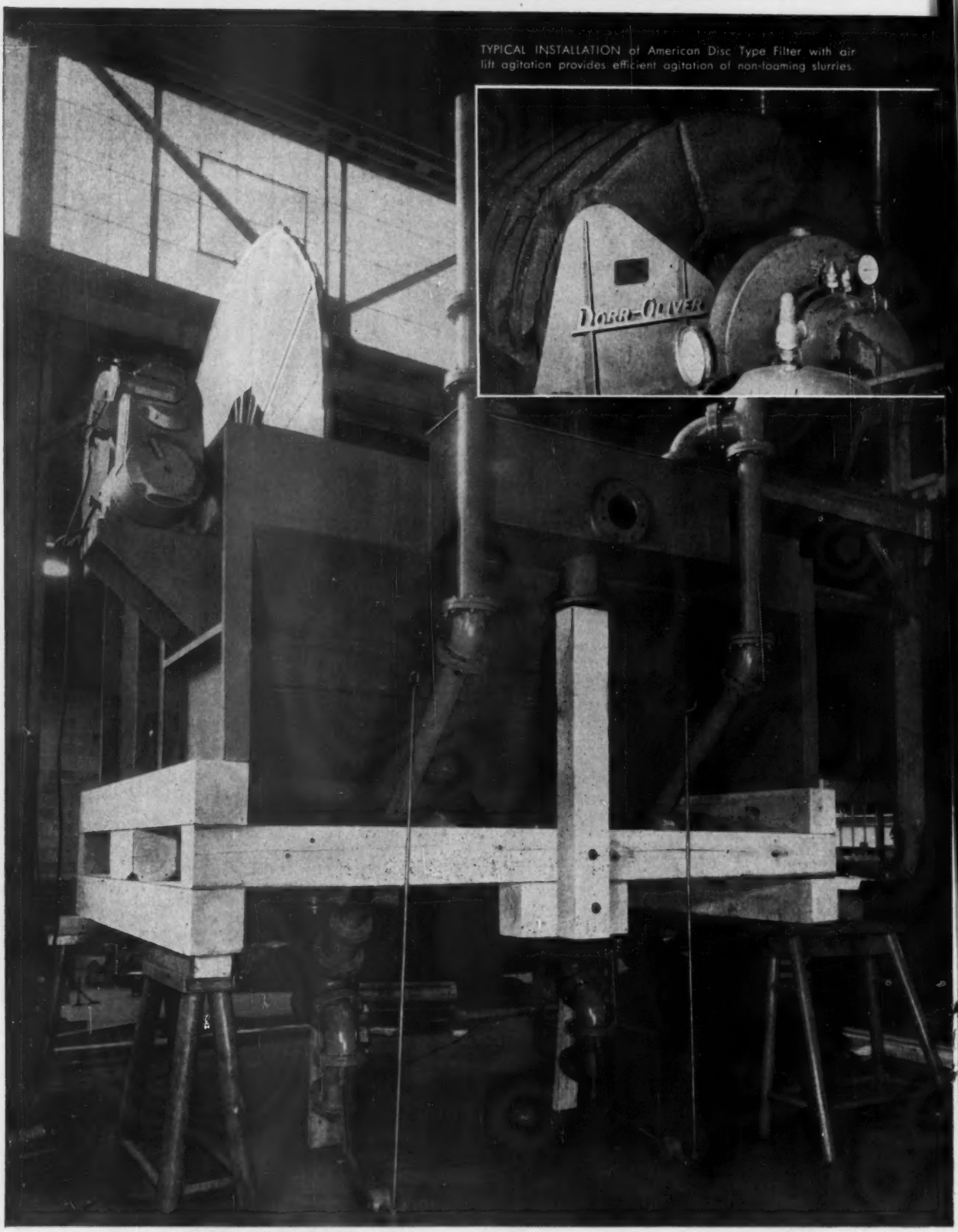
ion shocks and permit heavy loads, prolong open gear life.

Let your local Texaco lubrication representative show you how Texaco products can help lower your maintenance costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write to:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

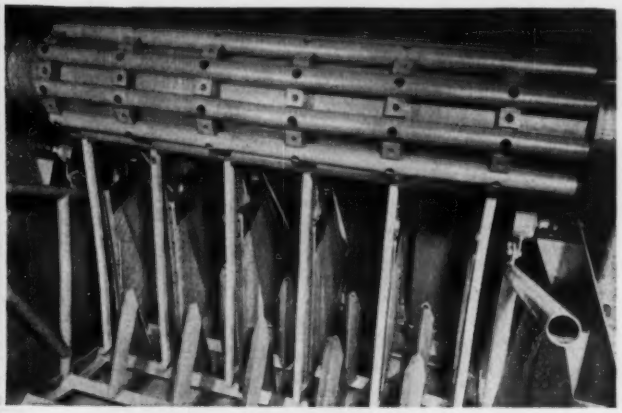
(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)



TYPICAL INSTALLATION of American Disc Type Filter with air lift agitation provides efficient agitation of non-foaming slurries.

AIR LIFT AGITATION EQUIPMENT, consisting of valves and piping, is shown in this factory floor photo of partially assembled filter. No moving parts—pressure and quantity of air controls agitation.

SWING TYPE AGITATOR, installed in filter tank, is shown in this close-up photo. Torsion bearings are at left and right, just under the main shaft.



now . . . from DORR-OLIVER

3 methods of agitation on AMERICAN FILTER

One of the most significant phases of Dorr-Oliver's continuing search for improved techniques in wet processing is the development of more efficient methods for slurry agitation on the American Disc Type Filter.

The recent introduction of torsion bearing swing type agitation is representative proof of the advanced technology resulting from this program. And now . . . with the development of air-lift agitation, Dorr-Oliver can provide three entirely different methods of agitation on the American Filter. Thus, regardless of physical characteristics of the material being handled the proper type of agitation is available from Dorr-Oliver.

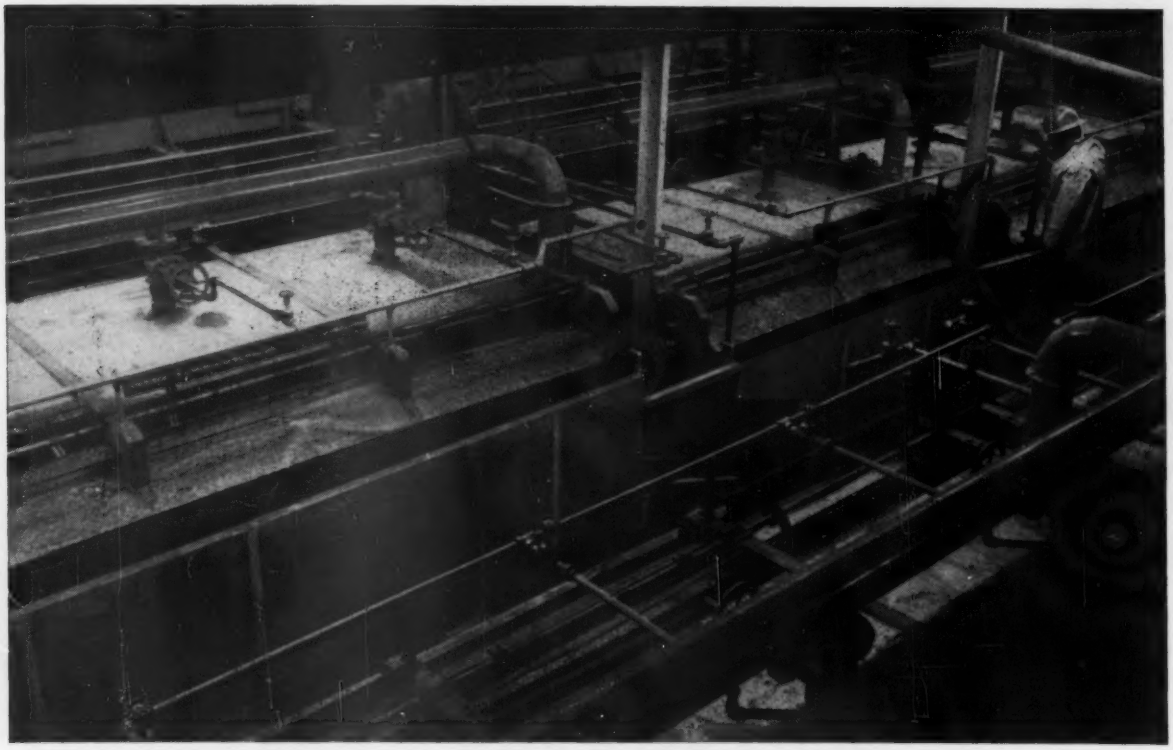
1. *AIR LIFT* AGITATION—means no moving or mechanical parts, the degree of agitation being controlled by the quantity and pressure of air injected. The result, on most non-foaming slurries where the introduction of air is not objectionable, is a homogeneous slurry and negligible maintenance.

2. *SWING TYPE* AGITATION – completely eliminates lubricating and stuffing box problems. This is accomplished by torsion bearings which incorporate a special rubber compound bonded to the agitator shaft to accommodate agitator assembly oscillation. Vertical picket members extend up between filter discs to assure uniform agitation from tank bottom to slurry surface. This method is ideally suited for easily foamed or oxidizable slurries.

3. *PADDLE TYPE* AGITATION – with controlled variable speed drive, is also excellent for handling easily foamed or oxidizable material.

The availability of these three distinctly different methods of agitation is but another result of Dorr-Oliver's progressive thinking in terms of wet processing. For more complete information on the American Filter just drop a line to Dorr-Oliver Incorporated, Stamford, Connecticut. American—T.M. Reg. U.S. Pat. Off.

DORR-OLIVER
INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U. S. A.



MODERN PIONEERS—The Cleveland-Cliffs Iron Company in Michigan is one of the pace setters in the conversion of low grade, nonmagnetic iron ore into a high iron content product. Pamak fatty acid is being used in the flotation phase of beneficiating the specular hematite material on the Marquette Range of Michigan.

PAMAK® FATTY ACID BOOSTS ORE RECOVERY

New techniques for processing low grade ore are the big news in the mining industry. Key to the process is beneficiation, and Pamak fatty acid has already demonstrated its usefulness as a collector in the beneficiation of such ores as Spodumene, Barite, Ilmenite, Fluorspar, Manganese oxide ores, and Scheelite.

Efficient recovery methods require a fatty acid of consistent high purity. Pamak is manufactured at Hercules' modern fractional distillation plants at Franklin, Virginia and Savannah, Georgia and also available in Canada. It is produced under continual quality control supervision to provide you with a fatty acid that is consistently more than 90% pure.

We'll be glad to discuss your specific requirements. For specifications and additional information, write:

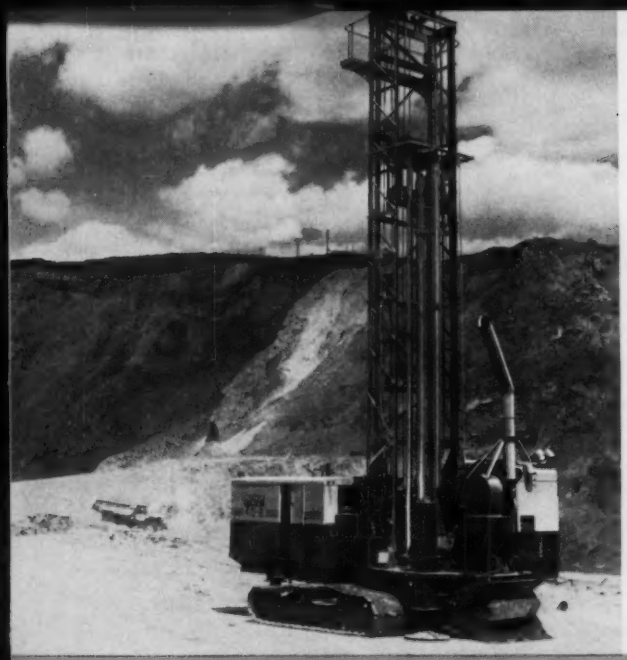
Industrial Chemical Department

HERCULES POWDER COMPANY

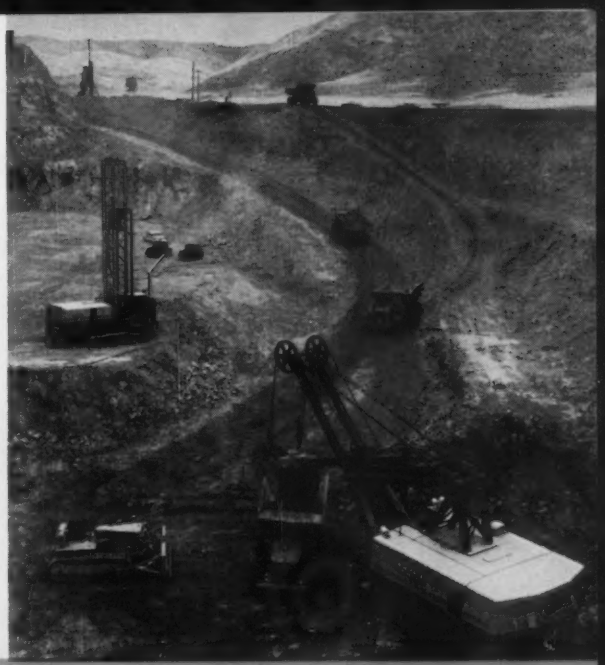
INCORPORATED

900 Market Street, Wilmington 99, Delaware

PT58-1



This 40-R is drilling 9-in. blast holes on an 18 x 18 ft. pattern at a large western copper mine. The material drilled is copper ore and rock overburden, consisting largely of hard-to-drill silicified and cherty material. Yet the 40-R is doing an outstanding job at this location.



A seemingly unsolvable drilling problem was resolved when this 40-R was added to the production team of a large Montana mining company. The problem: to speed up drilling operations enough to stay ahead of the 150-B shovel. The 40-R did it easily. It drills 9-in. holes through leached granite rock and a pyrite formation containing copper.

Why Do Mine Owners Prefer Bucyrus-Erie Rotaries?

The answer is summed up in one word — output! Ever since the first Bucyrus-Erie rotary was placed in operation in 1953, these machines have broken old footage records and retired scores of other drills from open pit mines everywhere. Two features are mainly responsible for this performance — variable drilling speed and variable pulldown pressure.

VARIABLE DRILLING SPEED is achieved through Ward Leonard variable voltage control. This control gives the operator smooth, instant command over rotation of the drill pipe. It lets him choose the most efficient speed for a given formation without stopping the drilling operation.

VARIABLE PULLDOWN PRESSURE on the bit is supplied hydraulically. It provides controlled load on drilling tools for maximum penetration, regardless of material.

The result is speedy, economical drilling of large-diameter holes. And with Bucyrus-Erie drills you get an extra bonus — parts and service second to none.

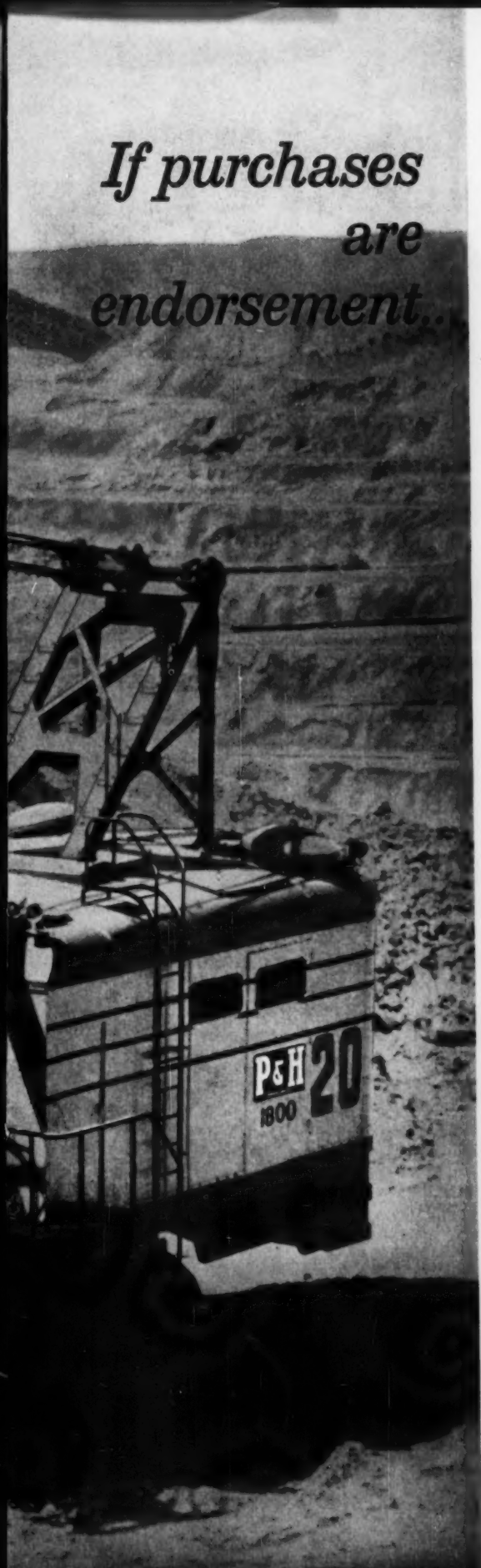
Bucyrus-Erie rotaries are available in two models — the 40-R with electric or diesel-electric power for drilling 6¾ to 9-in. holes, and the 50-R with full electric power for drilling 9⅞ to 12¼-in. holes.

Find out how the exclusive features of Bucyrus-Erie rotaries contribute to increased economy . . . can cut your drilling costs. Write direct: Bucyrus-Erie Company, South Milwaukee, Wisconsin.

79858C

A Familiar Sign . . . BUCYRUS ERIE *. . . at Scenes of Progress*

P&H



P&H ELECTRICS ARE THE CHOICE OF SOUTHWEST'S MINES

P&H Electrics are setting new standards of production and maintenance economy in Arizona, New Mexico, Nevada and Utah iron and copper mines. For instance, today *three or more* P&H Electric Shovels are working at *each* of 7 out of Arizona's 8 operating copper mines!

The pattern of preference for P&H among copper mine operators is especially significant. Here, industry management must constantly concern itself with selection and performance of the big shovels—the "giants" that require a large capital investment and importantly influence tonnage costs.

Reasons why P&H Electrics are a popular choice among the southwest's mines include such P&H innovations as MAGNETORQUE® and ELECTRONIC CONTROL—each of these *exclusive* P&H features contribute mightily to steady day-in and day-out high production.

Also, P&H users get single source responsibility, as P&H designs, manufactures and applies all electric rotating equipment specifically for electric shovel service.

HARNISCHFEGER

Construction & Mining Division
Milwaukee 46, Wisconsin

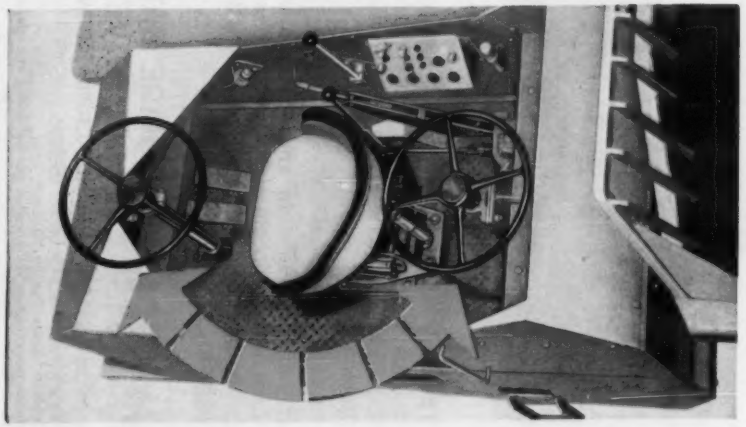
P&H ELECTRIC SHOVEL LINE: 3½ through 10 cu. yd. capacities

Now . . . a 10-YARD Dumptor®

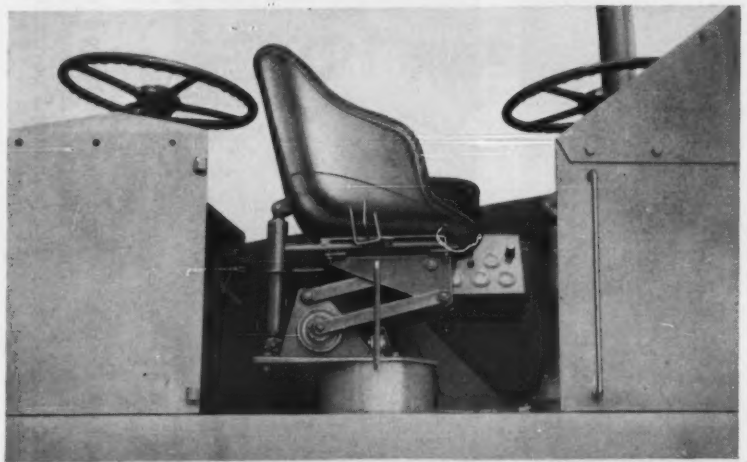
Meet the newest addition to Koehring® heavy-duty line . . . big 10-cu. yd. model 100 Dumptor with 30,000-pound payload capacity . . . 168 h.p. diesel engine . . . torque-converter drive . . . power steering.

PIVOTING SEAT... TWO-WAY CONTROLS...

for *no-turn* shuttle hauling



Operator always faces direction of travel . . . swings around *without leaving seat.* Pivoting seat with 2-way Dumptor controls let him operate with equal ease, comfort and safety in either direction.



- ***Here's a quick "preview" of new 10-yard Dumptor:***
- **Dual steering wheels, throttle, brake pedals located at both operating positions of pivoting seat.**
- **Directional travel and speed-range lever, and dump controls, centrally-located for 2-way operation.**
- **Constant-mesh transmission hydraulic clutches give full range of speeds up to 20 m.p.h. in either direction.**
- **Smooth torque-converter drive . . . power steering . . . big, safe, 4-wheel airbrakes, plus parking brake.**
- **2 ways to dump — *instantaneous*, with gravity . . . or *controlled*, with hydraulic cylinders.**
- **All-welded, multiple-ribbed body with rock-guards . . . bolted or free-swinging "kick-out" pan.**
- **Oscillating steering axle, center-pivot-mounted . . . heavy welded one-piece wishbone frame.**
- **Big drive tires eliminate need for springs on drive axle . . . *no spring maintenance.***

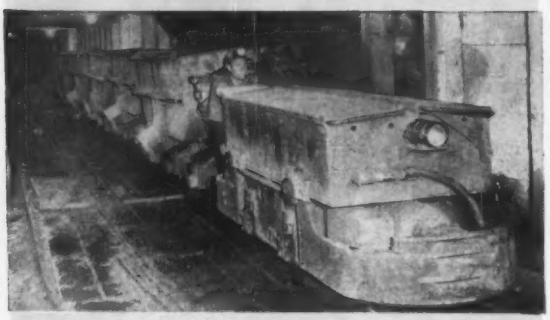
2 SIZES — In addition to this new 10-yard, Koehring also builds a smaller, companion-model 6-yard Dumptor. Both offer cost-cutting advantages you can't afford to miss. Why not call your Koehring distributor about them or write to us for information, today?

KOEHRING®
DIVISION OF KOEHRING COMPANY
MILWAUKEE 16 WISCONSIN
KOEHRING HEAVY DUTY

K818

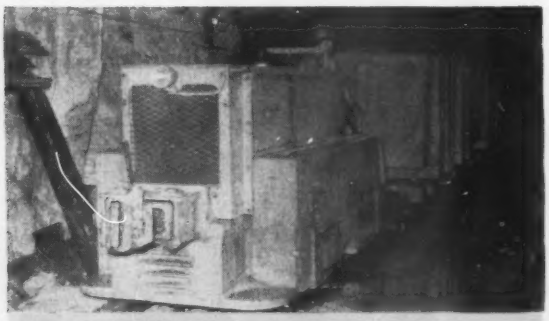
EXCAVATORS • CRANES • DUMPTORS • *twinbatch*® PAVERS • CONCRETE FINISHERS • MUD-JACK®

Mancha's Little Trammer, 1½-ton



Mancha's Standard AX, 5-ton

Storage Battery—Flexible and safe. Can be used anywhere—of particular advantage in heavily timbered areas. New designs of larger sizes meet main line haulage specifications.



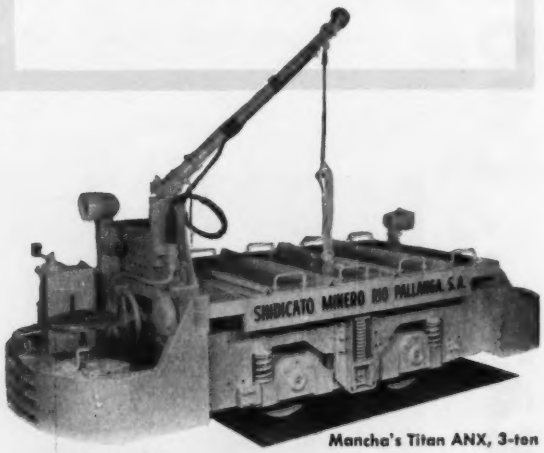
Mancha's D12CA, 12-ton

Mancha's D2HF, 2-ton

Diesel—Unlimited haulage range. Preferred for main line adit and tunnel haulage where ventilation is not a problem. No permanent power installation required.

Where haulage efficiency is highest you'll find MANCHA Locomotives

In metal and non-metallic mines . . . in tunnels, for light tramming or heavy hauls, long distances or short . . . there's a Mancha locomotive to fill the need. And for each application a "job analysis" assures a unit to meet conditions . . . to provide top efficiency.



Mancha's Titan ANX, 3-ton

Trolley—Most popular and lowest cost for continuous haulage demand where permanent installation is practical and trolley wire can be protected.

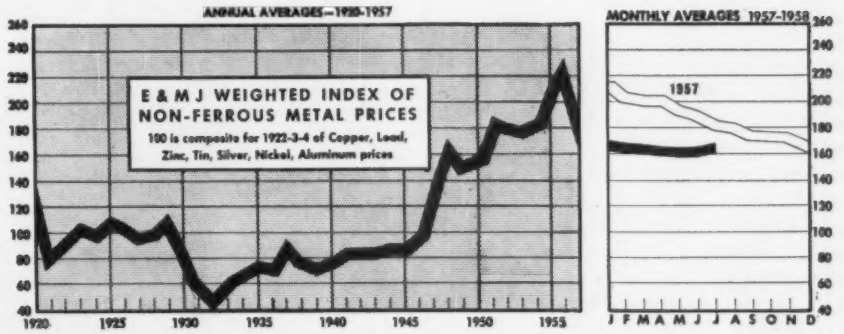
If you would like to know more about any of these Mancha locomotives or other sizes available for both mine and industrial applications, write us today.

MANCHA STORAGE BATTERY LOCOMOTIVE

DIVISION GOODMAN MANUFACTURING COMPANY
Halsted Street and 48th Place • Chicago 9, Illinois •
Cable Address: Mancha, Chicago
Mancha representatives are located in principal mining areas throughout the world.

E&MJ OUTLOOK

PRICES



MARKETS

E&MJ's nonferrous metal price index for July showed the first significant upturn since March 1956. The price index moved up from 164.73 for June to 167.24 for July. Price increases for tin and copper were responsible for the change.

American Zinc Institute has launched a newsletter, "The Zinc Spotlight," as an important step in the all-out drive of AZI, Lead Industries Association and supporters in Australia, Canada, Great Britain, Mexico and South America to expand world consumption of zinc and lead. The pilot issue announces a 750-page source-book, "Zinc—the Science and Technology of the Metal, Its Alloys and Compounds," which will be released in late fall.

●

AT HOME

Anaconda is sinking a 130-ft shaft to obtain volume samples of alumina-rich clays in a 3,000-acre optioned area near Moscow, Idaho. Samples will be tested in a pilot plant under construction at Anaconda, Mont. where a new flowsheet developed for the recovery of alumina from clay will be installed.

With a melting point of 2,345 deg F, beryllium is the only light metal that will resist some of the high temperatures encountered in modern airborne units. U.S. Air Force is now sponsoring a major development program to permit the use of beryllium in the new "space age."

A significant market indicator for lead usage in tetraethyl and replacement batteries is replacement auto tire shipments. This June, they were 15.3% above a year ago, and for the first half of 1958 they exceeded first-half shipments of 1957 by 3½%.

New Jersey Zinc Co. has developed a successful new process to produce spiegeleisen which will insure adequate supplies of its manganese-iron alloy for the steel industry.

●

LABOR

International Union of Mine, Mill and Smelter Workers' executive board concluded that the Seaton Plan of copper stockpiling, and lead-zinc subsidies would "least jeopardize our international relations or trade policies."

●

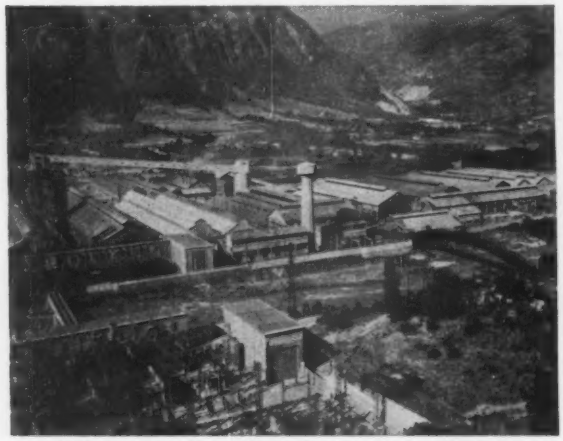
ABROAD

Russia is building a plant at Irkutsk, Siberia, to produce pure aluminum and other alloys directly from bauxite. No details were included in the Soviet news report.

Titanium Metals Corp. will expand its operations in Europe by forming a new company, Continental Titanium Metals Corp., with Deutsche Edelstahlwerke, Germany's leading specialty steel producer.

Peking radio reports discovery of a 2.2-billion-ton coal orebody, and a 100-million-ton iron orebody averaging 35% Fe in Yunnan Province.

"European demand for copper continues to be good," reports C. R. Cox, president of Kennecott—this in contrast to considerable sluggishness in American demand through July.



PECHINEY's aluminum plant at St. Jean de Maurienne, in the Alps, is one of Europe's largest. Annual capacity is more than 50,000 metric tons.

SABART, in the Pyrenees, is the site of another Pechiney operation. Four other projects are under way to feed a consumption estimated at 285,000 tons in 1966.

French Aluminum Plans 70% Increase

FRANCE IS PLANNING to increase aluminum production by 70% within the next two years to meet the rapid rise expected in French consumption.

Output of the two French aluminum producers, Pechiney and Ugine, will rise from 159,000 metric tons in 1957 to 275,000 in 1960. By 1964, it will reach 310,000 tons and production of 365,000 tons is forecast for 1966. Consumption—now 3½ kg per capita—is expected to jump from 152,000 tons in 1957 to 220,000 in 1961 and to at least 285,000 by 1966.

To meet their production targets, Pechiney and Ugine are at work on four projects which are scheduled for completion between July 1958 and 1966. One project which will permit the two companies to increase aluminum production in Metropolitan France by 75,000 tons annually starting in 1960—is entirely a French venture. In the three other projects—which will use energy and bauxite resources of French Africa—Pechiney and Ugine will be associated with a group of European, U.S. and Canadian aluminum companies.

The project closest to realization is the reduction plant in Edea, French Cameroons, built by Cie. Camerounaise de l'Aluminum Pechiney Ugine, known as Alucam. The plant started partial operation in 1957 and will reach full capacity of 45,000 tons a year in July 1958. Pechiney and Ugine hold a 89% interest in Alucam, entitling them to 40,000 tons a year. The remaining 11%—representing 5,000 tons—is held by a Belgian group Syndicat Belge de l'Aluminium.

Next on the program is a thermal power station fueled by natural gas from the Lacq field, near Pau in southwest France, and an electrolytic plant located close by. Construction of both is already under way, and operation will start in 1960. Main problem of the French aluminum industry in increasing production was to find new, cheap sources of power. The Lacq field, now producing 35-million cubic ft a day, with 175-million expected by the end of 1958 and 700-million cubic ft daily by 1961, provided a satisfactory answer. The electrolytic plant now under construction will have an initial capacity of 50,000 tons a year and will be owned by Pechiney. The Lacq thermal power station will also furnish electricity for a Ugine plant, to be built at Lannemezan, 50 miles away, next to another Ugine plant which produces 10,000 tons of aluminum annually. The new Ugine plant will have a capacity of 23,000 tons a year.

ALUCAM, the Pechiney-Ugine-Syndicate Belge d'Aluminium operation at Edea, in the French Cameroons, started operation in 1957, was to reach full capacity last month.

A third project calls for the construction of two plants in French Guinea, one for the treatment of bauxite which exists on the spot, and the other for the electrolytical reduction of alumina. Two international companies have been formed to build and run the plants. The alumina plant is now being built by Societe Fria-Cie. Internationale Pour la Production de l'Alumine, and operations will start in 1960, with an initial production of 480,000 tons of alumina annually. This will be raised as needs increase to 720,000 tons in a second stage and 1,200,000 tons in a third. Olin-Mathieson holds a 53.5% interest in Societe Fria. Pechiney and Ugine hold 26.5%, British Aluminium Co. Ltd. 10%, and Aluminium Industrie AG of Switzerland the remaining 10%. Although Olin-Mathieson holds a majority interest, French law demands that French com-

panies control the venture. A system of plural votes has therefore been adopted so that Pechiney and Ugine keep the upper hand. Proved reserves of the bauxite deposits near the Fria plant is already well in excess of 1-billion tons.

Second part of the Guinea project calls for the construction of a reduction plant at Souapite, using power of the Konkoure River, which could produce 3-billion kwh yearly. The plant will be built by Societe de l'Aluminium de Guinee, and will have a capacity of 150,000 tons yearly. Participants in the company are Pechiney and Ugine, with a 52% interest; Aluminium Ltd. of Canada, 20%; Vereinigte Aluminium Werke of Germany, 10%; Montecatini of Italy, 10%; Olin-Mathieson, 4%; British Aluminium Ltd. and Switzerland's Aluminium Industrie AG, 2% each. The World Bank has been asked for a loan of $70-million. The French government has offered to guarantee the loan, to pay part of costs and to give financial assistance to the company. If the World Bank loan is obtained in the near future, construction of the plant could begin in time for operations to start in 1964.

The fourth project—still in the study stage—is for a dam on the Kouilou River in the Middle Congo, capable of producing 7-billion kwh yearly, and an aluminum-reduction plant with a capacity of 250,000 tons annually. A study group, called Societe Civile d'Etudes Hydroelectriques du Konkoure et du Kouilou, including the French, German, Italian and Canadian companies in the Societe de l'Aluminium de Guinee, has already drawn up detailed plans for the project. The French government has agreed in principle to bear part of the cost, and a World Bank loan will be requested—probably this summer. If necessary capital can be obtained, the plants could be built between 1964 and 1966. However, in view of the slump in the world aluminum market—and the Belgian attempt to find capital for their big aluminum project in Inga, Belgian Congo—realization of the Kouilou project is very uncertain at this point.

Finally, Pechiney and Ugine are participating in Aluminga, the study group planning the Inga project, which will eventually give them part of Inga aluminum production.

Asarco's Black Lake Starts Asbestos Output

PRODUCTION STARTED in early July from the Black Lake asbestos deposit in Quebec owned by American Smelting & Refining Co. Dedication ceremonies will be held in the early fall, following shakedown of the plant.

Draining of Black Lake, necessary before mining could start, will be not completed for many months, but mining is taking place on the edge of the pit, which is along the lake. (See *E&MJ*, January 1956, p 91)

(*Continued on p 136*)

As We Went to Press . . .

Extension of DMEA's life came in the closing weeks of Congress. Another lease on life was also given to fluorspar and asbestos incentive purchases under Public Law 733 to Dec. 31, 1959.

Stepped up research projects for abrasives, asbestos, boron and phosphate have been announced by USBM. The abrasive study will feature work on zirconium bromide, and the asbestos effort will be toward developing a synthetic fiber.

Boron's uses and technical characteristics will be studied and a new planer will be studied for phosphate applications.

A record exploration program is under way in Quebec, with 49 projects under study by Department of Mines personnel, supplemented by university professors, graduate students and undergraduates.

Three of the parties are in the Cape Smith-Wakeham Bay region; three around Esker Lake, four west of Ungava Bay; three in the Mount Wright-Mount Reed region, others in Chibougamau and Western Quebec.

By the time you read this, the Minerals Stabilization Bill will be either:

(1) Passed and immediately operative;
(2) Passed but action postponed until January for lack of money;
(3) Dead.

The first was the hope of industry, Interior Department and mining-state Senators. But the big hurdle was the method of financing the bill. Senate wanted to grant borrowing authority for five years to the Secretary of the Interior. But the House preferred direct appropriations, which would require Interior's going to Congress each year for money approval and would give the House a chance to stop the program if they didn't like the way it was going.

If the bill started through with the direct appropriation provision, it was going to be left hanging at adjournment time. There was no time left to put through a major money bill. When Congress returns in January it might get passed, but not before then.

As we went to press, work was being devoted to a compromise which would at least give borrowing authority until next year, and would probably contain some direct appropriation provision for future purchases; or a provision giving House and Senate Appropriations committees power to review and act on future borrowing requests.

The bill, in House Interior Committee form at the end of July, still had to go through the House and then through the Senate-House conference committee.

But there was one more possibility. If the Middle East troubles continued, Congress could decide to hang around Washington beyond scheduled adjournment, and go ahead and pass the money bill while they're waiting and watching the Arabs and Khrushchev.

Spain will begin development of "radioactive minerals" in eight provinces, according to the Spanish Board of Nuclear Energy. A storage facility will be built in Andujar, Jaen province.

WASHINGTON IMPACT

Highlights

HOPELESS OPTIMISM—One Washington foreign affairs expert used this deceptively contradictory but accurate phrase this month to sum up his evaluation of the high-risk, small-gain outlook in the Middle East. It applies equally well to what metal-mineral men in Washington are saying as they peer into the mining industry's cloudy crystal ball as another Congress nears adjournment.

On the bright side are these indicators:

- Basic commodities, particularly metals and minerals, were beginning to feel signs of a business upturn before Iraq fell under Nasser's tide. Government price indicators began to firm and economic advisers were talking in terms of a Fall upswing following the current "bottoming out."
- The Middle East crisis is thought to be a more-or-less continuing one, barring a hot war. In either case, the psychological lift it will give buyers and investors in the mining industry will solve at least some of the more pressing present problems of oversupply.
- The long-range economic outlook remains hopeful, now even more so. A good example of how metal-mineral producers are campaigning for Washington help in expanding future markets is the drive being put on by major domestic aluminum producers before Congressional committees (see story this page).
- The Reciprocal Trade Agreements Act extension is hard to assess. But its language giving domestic producers an easier avenue to ODCM import relief on grounds of national security may be important to mining interests. Anti-dumping petitions, too, may increase.
- On the other side of the international economic coin is State Department's new willingness to talk multi-lateral commodity solutions.
- It's too early to tell what the Administration's new minerals stabilization efforts will mean. Shortly before this column went to press, Congress seemed virtually certain to pass new legislation, including stepped-up exploration and development aids, and a direction to Agriculture Department to ease its barter regulations.

But like the trade program, its administration rather than the law itself will determine how well it works.

On the other hand, producers, Washington representatives and mining-state Congressmen feel their jobs are still cut out for them in the coming months. Tariff Commission is currently studying mercury and tungsten imports, may take a look at iron ore trade. These preliminary investigations will lay the groundwork for possible escape-clause relief petitions on behalf of a number of minerals. And import relief through defense-essentiality or anti-dumping laws (above), will take hard argument before they stand a chance.

MINES BUREAU RESEARCH—Interior Department's Bureau of Mines is sharply increasing its research activities. Director Marling J. Ankeny announced last month that new projects are planned for beryl, columbium-tantalum, mercury, zirconium and hafnium.

The beryl program is tied to what the Bureau calls "fast-growing needs in the missile, aircraft and atomic energy fields." It will consist of a "nationwide hunt" for deposits, including a new look at known pegmatite areas. Also, new processing methods will be sought to recover deposits that don't economically lend themselves to flotation and concentration methods.

Columbium-tantalum research will be headquartered at the Bureau's northwest electro-development laboratory at Albany, Ore. New deposits in Arizona, Idaho and Montana will be sought, as well as improved processing techniques for turning out Cb-Ta for nuclear reactors, guided missiles, jet engines and electronic computers.

The mercury program will spread over Alaska, Arizona, Arkansas, California, Idaho, Nevada, Oregon, Texas, Utah and Washington. A report will be published on known and prospective mines and the Albany plant will experiment with new processing techniques.

Albany will also be in charge of the zirconium-hafnium project, where the Kroll process method was first developed. The program will center around metallurgical research, but new sources also will be explored. Fabrication and separation studies are planned.

Aluminum Producers Seek Federal Support

Domestic aluminum producers have kicked off a concerted public relations campaign to stir up Washington's interest in their current market problems and, if possible, enlist Government help in solving them.

In rapid-fire succession last month, the industry's five major companies, led by Reynolds Metals Co., made these moves:

- Sought and failed to win first Administration support, then Senate and finally House backing for their drive to get aluminum included in the proposed Federal minerals stabilization program.
- Backed by a letter from 17 Senators, got audiences for their top executives with Undersecretary of State for economic affairs C. Douglas Dillon, Treasury Department officials, Commerce Secretary Sinclair Weeks, and the director of the new Office of Defense and Civilian Mobilization, Leo Hoegh.
- Urged the formation of a Government-sponsored international program to channel U.S. and Canadian surplus stocks into underdeveloped foreign markets and help create new overseas markets.
- Asked for short-term Government help in the way of tariff commission escape clause relief against foreign imports, a Treasury Department anti-dumping finding, ODCM import protection on grounds of national security, or State Department-negotiated trade agreements aimed at raising U.S. import barriers or lowering those of foreign markets.

Industry's reason for its sudden shotgun efforts is a relatively recent but fast-growing domestic surplus, aggravated by increasing imports of foreign aluminum manufactures and the threat of Russia's newly increased invasion of western markets.

There is no sign that industry will get any of the specific help it is asking. In fact, producers have not yet filed for escape-clause, defense-essentiality, or anti-dumping relief.

What the producers are aiming at is to call attention to their temporary problem, in the hope of at least laying the groundwork for long-range Government help in expanding overseas markets—if not for immediate emergency action to curb imports.

"A clue to how this can be done," the producers have been hinting to Government officials, "may be found in our present surplus wheat program." The industry would like to see a similar program set up for aluminum—using domestic and Canadian surpluses as a tool for foreign aid, barter and the like, in order to expand overseas markets for the metal in construction and defense projects.

So far, Government officials will say only that they are "considering" industry's proposal. But the State Department has taken a new interest in at least talking with other nations on the subject of international commodity problems and

even controls. The aluminum producers' new campaign fits in with the sympathetic ear the Department is giving to world market problems affecting coffee, lead, zinc, copper, copra and tin.

The aluminum industry's drive also reflects the growing belief among basic metal-mineral producers generally that the real answer to problems of current oversupply lie in expanding foreign markets and developing new uses for their products.

No Controls Foreseen

U.S. Marines hadn't been on the Lebanese beach long enough for their pants to dry last month before the new Office of Defense and Civilian Mobilization began to get bombarded with questions on what the Middle East crisis might mean to domestic producers and businessmen in terms of Korean-conflict-type controls.

The answers turned out to be comparatively simple, and were keyed in large measure to Washington's whopping superabundance of strategic and critical metals and minerals.

ODCM's legal and mobilization hands say first that no one from the President down has any thought of clamping on commodity and material allocations, consumer rationing or price-wage-rent-credit curbs. For one thing, they feel the Administration has all the authority it needs to channel materials to the military and even to civilian components of the nation's economy if and when needed under the flexibly written Defense Production Act. Direct consumer controls, covering prices, wages and rents would take Congressional action.

But materials production and distribution are so thoroughly blanketed in the law's broad language that Washington could overnight tell producers of any product how much to turn out and to whom to sell it.

Underneath that authority is the greatest stockpile in history of metal-mineral supplies, a $7.5-billion stockpile. Defense planners figure it is more than enough to meet any mobilization situation—ranging from total all-out nuclear war and a much longer rehabilitation period to any number of the brush-fire wars of the Korean type. Further, there is no hard indication that the Middle East rhubarb will mushroom even to Korean proportions.

Present controls are nominal. Four materials—aluminum, copper, nickel and steel—remain on a so-called defense materials system list. This is the list that could be expanded to cover baked beans if necessary to prevent "dislocations" in even normal civilian markets. But as of now, there is no hint of change in the foreseeable future, all that is required under the DMS list is that suppliers of these materials to the Pentagon and Atomic Energy Commission must give Commerce Department's business and Defense Services Administration a running report of how much they produce and sell, and to whom.

Labor This Month

MINE-MILL BACKS SEATON: In an "emergency message" to Congress, leaders of the Mine-Mill and Smelter Workers threw timely support to the so-called Seaton Plan for aiding the nonferrous metals industry. Though no cure-all, they stated that this "is the only piece of legislation that can conceivably halt the downward plunge" of production in the metals industry. Besides authorizing the Interior Secretary to buy 150,000 tons of copper, it would provide subsidies to lead and zinc producers. The Mine-Mill position was relayed directly to the House in the wake of Senate approval of the Seaton Plan.

NEW TEAMSTER OVERTURE TO MINE-MILL? One big question soon to be resolved is the International Brotherhood of Teamsters intentions towards Mine-Mill. The trucking union has made a series of alliances with other unions—in and out of the AFL-CIO—since it was expelled from the labor federation last December. These mutual-aid pacts were made in the face of disapproval by AFL-CIO president George Meany. And it was Meany's disapproval that forced the Teamsters to drop their original plan for a mutual-help pact with Mine-Mill nearly two years ago. Meany's position: Mine-Mill had been expelled from the old CIO on Communist domination charges; no AFL-CIO affiliate had a right to make deals with an expelled union. But, since the Teamsters expulsion in turn, other important AFL-CIO unions are readily signing up with the Teamsters.

WILL HOFFA PULL BACK TWICE? Teamster president James R. Hoffa bowed once to Meany's demands—he dropped plans for a $400,000 deal that would align the nonferrous union workers with the truck drivers hauling the ore. This could be a powerful alliance to face mine operators. There's no question that Hoffa and the Teamsters' Western Conference would like to bring up the pact again, but there's one hitch. The redoubtable Hoffa still wants back in the AFL-CIO. If he goes back to Mine-Mill it's another roadblock to the Teamster return. Meany is opposed to taking the Teamsters back anyway. A Mine-Mill deal with the Teamsters could clinch that opposition. That's why the Teamsters are holding off until their future with the AFL-CIO is cleared up, once and for all.

RIGHT-TO-WORK IS COMING BACK: A brand new try at adding more Right-To-Work laws to the 18 state total will come in November—in the national elections. Some half-dozen states may have referendums on the matter, including Colorado. Other prospects are Ohio, California, Kansas, Idaho and Washington. This is the biggest attempt so far by the election route, despite several vote flops in recent years. State Right-To-Work laws have almost entirely been put on the books by state legislatures. This time, however, RTW proponents are turning to the public in hopes of a big breakthrough.

There's a good chance for a score in 1958. Union officials concede they're worried this time. They're not betting they'll lose at the polls, but there are enough intangibles to keep them on edge. They're worried whether: (1) 18 months of union corruption exposures will be reflected in a pro-Right-To-Work vote in November, (2) a small vote on RTW petitions might go against labor, even while the candidate vote might go in favor, (3) the public is being sold on the popular "Right-To-Work" label, while counter-word campaigns such as "Right-To-Sweat" aren't scoring.

WAGE GAINS STAY HIGH: Despite the 1958 recession, unions are scoring well this year at the bargaining table. Mid-year returns show an average payroll gain of just under 10c; less than a cent lower than last year's average. Biggest hit so far by the business downturn has been manufacturing where contracts run almost 2c lower. The rubber workers, for instance, settled for 8c, or half their 1957 total. But, construction, trucking and aircraft are holding up at 10c to 12c, or higher.

Biggest reason for union bargaining success; some 4-million workers are collecting automatic wage increases agreed to in earlier contracts. They run from up to 20c for steel workers, to 8c for electrical workers. This provides a sturdy wage floor and employers are finding it difficult to settle below the built-in levels.

MARKETS

U.S. Copper Producers at 26½c; Smelters 27c. Aluminum Raised 0.7c

THE E&MJ INDEX of nonferrous metal prices rose to 167.24% of the 1922-'24 average for July, from 164.73 for June. The rise is attributable mainly to the rise in copper prices; the slight rise in tin had some effect.

Subsidy payments to U. S. mining firms were still uncertain as of August 1. The House Interior Committee had rejected some of the more liberal provisions of the bill as proposed by its subcommittee. The lead maximum subsidy is reduced to 3.9c per lb and zinc to 2.9c, as in the Senate version. For 500 tons of lead sold per quarter, an additional amount of 1.125c, and for zinc of 0.55c, may be paid. These changes modify the table that appeared here last month. Column F remains at 15.5c and 13.5c. The maximum market prices at which the full subsidy payments may be made are 10.25c and for zinc 8.2c. The maximum a company will get from the subsidy plus the market price will be about 14.15c for lead and 11.1c for zinc—they will not get the 15.5c and 13.5c mentioned in the bill.

The bill includes provision to buy 150,000 tons of copper at the market price but not above 27½c delivered.

It includes bonus payments for beryl ore, metallurgical chromite and columbium-tantalum. The bonus for chromite is dropped from $46 to $35 per long dry ton. Tungsten ore mining firms will receive up to $18 per stu, the sum of the market price and subsidy not to exceed $36. Firms selling under 250 stu per quarter will get an additional payment.

Most significantly, the provision to permit financing by borrowing was dropped and a $650-million authorization was provided for the five-year period. The House controls money appropriations and the borrowing measure would have in effect largely eliminated this—some members felt such a bill would have no chance of House passage. But it also may stop the bill—many observers say there may not be time to get a money bill through both Houses. It then might have to wait until January. And then conditions may be improving and no bill might get through. The House Rules Committee may hold the bill up.

Sales of copper in the U. S. in July were the lowest in years, including those months during which there were strikes against the major copper companies. To some extent these low sales, reported to *E&MJ* for calculating average prices, reflect the accelerated shipments and sales in June in anticipation of price increases. The normal seasonal drop also contributed to the low figure. Copper Association reports of sales for shipment in July were also considerably lower than for preceding months. Data on sales for shipment in August also showed a low figure. This was expected for the reasons indicated above.

Shipments of fabricated copper products in June were exceptionally high, also in anticipation of higher prices. Some observers claim that there is now no prospect for lower copper prices, and a possibility of higher ones, and that therefore buyers of copper and products, from the fabricator to the final consumer, will increase purchases. Some indicate hesitancy on this score—they suggest that if the Government copper stockpiling bill is not accepted the market will not strengthen further and that if rumors of recession developments in the U.K. are true, some weakening is possible. But officials of copper firms seem genuinely optimistic.

Analysts attribute the strength in copper to a number of factors: 1) the reduction in intake of custom smelters, 2) belief the U. S. Government will take off the market 150,000 tons at up to 27½c per lb—possibly causing copper firms to raise in order to get this price, 3) speculative buying on the London Metal Exchange and N. Y. Commodity Exchange which in turn raised the price paid for those firms buying copper on the LME basis, 4) some indications the recession in the U. S. is receding, 5) the belief in copper circles an informal agreement, at least outside the U. S., among copper companies is affecting output and prices.

Kennecott raised its price of electrolytic copper delivered to U. S. buyers to 26½c per lb effective July 17. It has been said the company believed the dual price situation among U. S. producers (Anaconda and Phelps Dodge had raised from 25c on June 17 and July 2) was hurting the sales of copper products. It would appear the dual price situation would have helped the sale of products by the low priced sellers. Other sellers went to 26½c.

Though Anaconda's subsidiaries had announced their prices for fabricated products were up to the 26½c basis on June 17, in fact they could not charge this when others were 1½c lower. When Phelps Dodge rose on July 2 for copper and products, Anaconda reasserted the 26½c basis for products; with most firms at the 25c basis it is doubtful they were able to sell at the higher prices. Certainly the higher prices did nothing to maintain the relative advantage to U. S. copper industries arising from the resumption of U. S. tariffs (1.7c) on copper and products July 1. With the current price advances in Europe—Europeans during July paid almost as much for copper as U. S. buyers—maintenance of the lower prices for products here would have made importing most difficult. This fact, reporters decided from discussions with officials of major copper companies, had been the major determinant in holding out against raising to 26½c.

Custom smelters raised to 26c late on July 2. By July 18 all smelters and producers were at the 26½c price. Merchant sales are at about the same price. Katanga raised to 26.3c July 31; it had gone to 25.85c at U. S. and main European ports July 22. August 1 smelters raised to 27c.

Conferences held in Europe by delegates to one of the NATO organizations, COCOM, including U. S. representatives, have reached some agreement on removing restrictions on exports to the USSR and satellites. A wider range of copper and products may be exportable to those countries.

Brassmill product shipments in the U. S. in the first half of 1958 were down sharply; the total was down about 20% from the 1957 average and was little more than half the 1953 rate. But the second quarter was slightly better than the first.

Alcoa raised its price for aluminum pig August 1 to 24.7c from 24c; its other prices are being raised correspondingly. The other U. S. producers raised to the same price. Alcan has habitually followed the policy of pricing in the U. S. at the same price as producers here; it also went to 24.7c. It has been selling in Europe at 22½c, but with its "loyalty" allowance of 2% and delivery actually at plants, it amounts possibly to about 21½c c.i.f. Its U. S. price at 24c in effect had been about 22½c after payment of duty.

In addition to Alcan metal, Norwegian and French metal and a little from other sources is entering the U. S. Russian metal prices in Europe were raised from about £160 to £165(20.7c) (Russian barter prices are lower). Apparently they are selling less than formerly. Some analysts say producers here told European fabricators that if they bought Russian metal the pressure to exclude their semis from the U. S. would mount, but if they bought U. S. metal, pressure would likely cease.

Lead has been fairly steady. Many observers feel if the subsidy bill is accepted lead may drop to near the 10.25c price, the maximum at which miners get the top subsidy. July sales were about the same as June but a little better than May. If the more liberal barter bill is put into effect it may strengthen the foreign market and offset the depressing effect the U. S. subsidy bill might have on it.

Zinc prices have been maintained at the 10c level for uncertain reasons, some market analysts say. They suggest the U. S. price is likely to drop if the subsidy bill is enacted—possibly even to 8.2c, the highest market price at which the top zinc subsidy (2.9c) will be paid. But the main pressure on zinc has been in Special High grade.

Average Prices July *(E&MJ Quotations)*

Copper:

Electrolytic, domestic refinery ..	25.674
Electrolytic, export refinery ...	24.397

Lead:

Common, New York	11.000
Common, St. Louis	10.800

Silver and sterling exchange:

Silver, New York, per oz.	88.625
Silver, London, pence per oz. ..	75.000
Sterling Exchange	280.398

Zinc:

Prime, Western, East St. Louis	10.000
Prime, Western, delivered (g) ..	10.500

Tin:

New York Straits	94.957
Gold per oz. U. S. price	$35.000
Quicksilver, per flask	$230.038
Antimony, (E&MJ) (d)	32.590
Antimony, bulk, Laredo	29.000
Antimony, in cases, Laredo .	29.500
Platinum, refined, per oz. ...	$62.385
Cadmium (a)	155.000
Cadmium (b)	155.000
Cadmium (c)	155.000
Aluminum, 99% plus ingot ..	26.100
Magnesium, ingot	35.250
Nickel (f)	74.000

Domestic quotations, unless otherwise stated, are in cents per pound. Sterling exchange checks, in cents. Quicksilver, per flask of 76 lb.

(a) Cadmium average based on the producers quotations.

(b) Cadmium average based on the average of the producers' and platers' quotations.

(c) Cadmium average based on platers' quotation.

(d) Domestic 5 tons or more but less than carload lots, packed in case f.o.b. New York.

(f) Contract price, f.o.b. Port Colborne U.S. duty included.

(g) Delivered where freight exceeds 0.5c.

"Free" Gold Market

Dealings declined 41% from last month's postwar record. Prices strengthened fractionally but fell 2-5% in India. No Soviet gold sales were reported. However, it is rumored that sales of about $150-million are planned before the year's end. U.S. gold losses continued at a slower rate bringing the total gold outflow to over $1.5-billion since the beginning of the year. Pick's World Currency Report quotes on "free gold" per fine oz as follows:

	COINS		BARS (12.5 kg)	
	June 30	July 31	June 30	July 31
NEW YORK, transit	....	....	$35.08½	$35.08½
MANILA	$41.75	$41.75	35.75	35.75
HONG KONG	46.95	46.60	38.35	38.35
BOMBAY	60.25	56.00	57.50	55.75
TANGIER	40.50	40.35	35.20	35.21
BEIRUT	41.35	42.65	35.25	35.25
PARIS	40.25	41.20	36.15	36.30
BUENOS AIRES	38.80	39.10	36.40	36.35

Note: Prices are quoted at the free or black market value of the U. S. dollar in the local markets.

Custom Smelter Copper Price

Based on flat price and E&MJ-average price sales in U. S. for month of July reported by American Smelting & Refining Co.: electrolytic copper in standard shapes, adjusted to nearest 1/16c; ¼c deducted for selling commission. .....

Delivered Consumers' plant	25.750 lb
F.o.b. refinery	25.350 lb

Major Metals

U. S. DAILY AND AVERAGE PRICES

July 1958	Electrolytic Copper (a) Domestic	(b) Export	Lead New York	Lead St. Louis	Zinc (f) Delivered	Zinc East St. Louis	Aluminum Primary Pig 99%	Straits Tin New York
1	25.000	24.175	11.000	10.800	10.500	10.000	24.000	94.125
2	25.175	23.800	11.000	10.800	10.500	10.000	24.000	94.375
3	25.925	23.750	11.000	10.800	10.500	10.000	24.000	94.250
4	Holiday	23.300	Holiday					
5	No Market	No Market	11.000	10.800	10.500	10.000	24.000	94.250
7	25.500	23.325	11.000	10.800	10.500	10.000	24.000	94.250
8	25.425	23.775	11.000	10.800	10.500	10.000	24.000	94.125
9	25.100	24.050	11.000	10.800	10.500	10.000	24.000	94.000
10	25.200	24.100	11.000	10.800	10.500	10.000	24.000	93.875
11	25.025	24.125	11.000	10.800	10.500	10.000	24.000	93.875
12	No Market	No Market	11.000	10.800	10.500	10.000	24.000	93.875
14	25.275	24.050	11.000	10.800	10.500	10.000	24.000	94.000
15	25.025	24.150	11.000	10.800	10.500	10.000	24.000	94.250
16	25.175	24.500	11.000	10.800	10.500	10.000	24.000	94.750
17	26.000	24.575	11.000	10.800	10.500	10.000	24.000	95.250
18	26.100	24.875	11.000	10.800	10.500	10.000	24.000	96.500
19	No Market	No Market	11.000	10.800	10.500	10.000	24.000	96.500
21	26.100	24.750	11.000	10.800	10.500	10.000	24.000	95.250
22	26.100	24.825	11.000	10.800	10.500	10.000	24.000	95.125
23	26.100	24.875	11.000	10.800	10.500	10.000	24.000	95.250
24	26.100	24.900	11.000	10.800	10.500	10.000	24.000	95.500
25	26.100	24.950	11.000	10.800	10.500	10.000	24.000	96.250
26	No Market	No Market	11.000	10.800	10.500	10.000	24.000	96.250
28	26.100	24.750	11.000	10.800	10.500	10.000	24.000	96.125
29	26.100	25.000	11.000	10.800	10.500	10.000	24.000	95.750
30	26.100	25.275	11.000	10.800	10.500	10.000	24.000	95.625
31	26.100	25.250	11.000	10.800	10.500	10.000	24.000	95.500
AVERAGES FOR MONTH								
July	25.674	24.397	11.000	10.800	10.500	10.000	24.000	94.957
AVERAGES FOR WEEK								
July 2	24.925	24.105	11.333	11.133	10.500	10.000	24.000	94.500
9	24.488	23.640	11.000	10.800	10.500	10.000	24.000	94.175
16	25.140	24.185	11.000	10.800	10.500	10.000	24.000	94.104
23	26.080	24.780	11.000	10.800	10.500	10.000	24.000	95.646
30	26.100	24.975	11.000	10.800	10.500	10.000	24.000	95.917
CALENDAR WEEK AVERAGES								
July 5	25.200	23.840	11.100	10.900	10.500	10.000	24.000	94.300
12	25.250	23.875	11.000	10.800	10.500	10.000	24.000	94.000
19	25.515	24.430	11.000	10.800	10.500	10.000	24.000	95.208
26	26.100	24.860	11.000	10.800	10.500	10.000	24.000	95.604

Silver, Gold and Sterling

DAILY AND AVERAGE PRICES

July 1958	Silver (c) New York	Silver London	Sterling Exchange	Gold London	Gold (d) United States
1	88.625	75.000d.	280.3593	250s. 5½d.	$35.00
2	88.625	75.000d.	280.4250	250s. 4½d.	35.00
3	88.625	75.000d.	280.5000	250s. 4d	35.00
4	Holiday	75.000d.	Holiday	250s. 1¼d.	35.00
5	(e)	(e)	(e)	(e)	35.00
7	88.625	75.000d.	280.8437	250s. ¾d.	35.00
8	88.625	75.000d.	280.5000	249s. 11½d.	35.00
9	88.625	75.000d.	280.4375	250s. 4½d.	35.00
10	88.625	75.000d.	280.5000	250s. 4d.	35.00
11	88.625	75.000d.	280.5312	250s. 2½d.	35.00
12	(e)	(e)	(e)	(e)	35.00
14	88.625	75.000d.	280.2812	250s. 4½d.	35.00
15	88.625	75.000d.	280.1562	250s. 7½d.	35.00
16	88.625	75.000d.	280.1250	250s. 10d.	35.00
17	88.625	75.000d.	280.0312	250s. 10¾d.	35.00
18	88.625	75.000d.	280.2187	250s. 11d.	35.00
19	(e)	(e)	(e)	(e)	35.00
21	88.625	75.000d.	280.4375	250s. 6¼d.	35.00
22	88.625	75.000d.	280.4687	250s. 6¼d.	35.00
23	88.625	75.000d.	280.3125	250s. 6¼d.	35.00
24	88.625	75.000d.	280.3437	250s. 7½d.	35.00
25	88.625	75.000d.	280.3750	250s. 7d.	35.00
26	(e)	(e)	(e)	(e)	35.00
28	88.625	75.000d.	280.5000	250s. 5d.	35.00
29	88.625	75.000d.	280.4375	250s. 3d.	35.00
30	88.625	75.000d.	280.4687	250s. 3¼d.	35.00
31	88.625	75.000d.	280.5000	250s. 4¼d.	35.00
AVERAGES FOR MONTH					
July	88.625	75.000d.	280.398	—	35.00
AVERAGES FOR WEEK					
July 2	88.625	—	280.324	—	$35.00
9	88.625	—	280.570	—	35.00
16	88.625	—	280.319	—	35.00
23	88.625	—	280.294	—	35.00
30	88.625	—	280.425	—	35.00

Calendar Week Averages: New York Silver: July 5th, 88.625; 12th, 88.625; 19th, 88.625; 26th, 88.625.

(e) No Market (Saturday).

THE above quotations for major non-ferrous metals are our appraisal of the important United States markets, based on sales reported by producers and agencies. They are reduced to the basis of cash, New York or St. Louis. All prices, except gold and silver, are in cents per pound.

(a) Net prices at refineries on Atlantic seaboard. To arrive at the delivered New England basis add 0.400c per pound, the average differencial for delivery charges.

(b) Our export quotations for copper reflect prices obtaining in the open market and are based on sales in the foreign market reduced to the f.o.b. refinery equivalent, Atlantic seaboard. On f.a.s. transactions we deduct 0.125c for lighterage, etc., to arrive at the f.o.b. refinery quotation.

Copper, lead and zinc quotations are based on sales for both prompt and future deliveries; tin quotations are for prompt delivery only.

Quotations for copper are for the ordinary forms of wirebars and ingots; cathodes are sold at a discount of 0.125c to 0.15c per pound. Quotations for zinc are based on Prime Western brands. Zinc in New York commands a premium over the St. Louis basis equal to the freight differential. Contract prices for High Grade zinc delivered in the East, Middle West, and West effective April 9, 1958, commanded a premium of 1c per pound over the current market for Prime Western; Special High Grade 1.25c effective April 9, 1958.

(f) Prime Western delivered where freight from E. St. Louis exceeds one-half cent.

Quotations for lead are based on domestic common lead. Corroding lead commands a premium of 10 points (almost all U. S. lead is corroding grade).

(c) The daily silver quotation reported by Handy & Harman, in cents and fractions of a cent per troy ounce, is the price paid by Handy & Harman in settlement for silver contained in unrefined silver-bearing materials submitted to them for refining. It is determined on the basis of offers of bar silver .999 fine as made to Handy & Harman for nearby delivery at New York by regular suppliers in quantities sufficient to meet daily requirements, and it is usually one quarter cent below the price at which such offers are made.

The Treasury's purchase price of newly mined domestic silver is 90.5 per troy ounce 1000 fine effective July 1, 1946. London silver in pence per troy ounce, basis .999 fine.

(d) U. S. Treasury's gold price. Actual payment by the United States Treasury for gold is at 99.75 per cent of the price quoted by the Treasury, which is equal to $34.9125.

MARKETS *(Continued)*

London Metal Exchange Quotations

July	COPPER Cash Bid	COPPER Cash Asked	COPPER 3 Mo. Bid	COPPER 3 Mo. Asked	LEAD Current Month Bid	LEAD Current Month Asked	LEAD 3 Mo. Bid	LEAD 3 Mo. Asked	ZINC Current Month Bid	ZINC Current Month Asked	ZINC 3 Mo. Bid	ZINC 3 Mo. Asked	TIN Cash Bid	TIN Cash Asked	TIN 3 Mo. Bid	TIN 3 Mo. Asked
1	195¾	196	196¾	197	73	73¼	73⅞	74	63¼	63¼	63⅞	64	730	730½	731	731½
2	195	195¼	196	196¼	72¼	72¾	73¼	73⅝	63	63⅛	63½	63⅝	730	730½	730½	731
3	193	193¼	194⅛	195	71⅝	72	72⅝	72⅞	62⅝	62¾	63	63⅛	730	730½	730½	731
4	191¼	191¾	192⅛	192⅝	71½	71⅝	73⅛	73¼	62½	63	63¼	63½	730	730½	729	729½
7	193	193¼	194½	194⅝	71⅝	71⅞	73⅛	73¼	62⅝	62⅞	63¼	63½	730	730½	729	729½
8	196	196½	197½	197⅝	71⅝	72	73⅝	73½	63¼	63½	63¾	64	730	730½	730½	731
9	196½	197	197	197½	71¾	72	73½	73⅝	63½	63¾	64	64¼	730½	731	731	731½
10	195¾	196¼	196¼	196½	71⅝	71½	73½	73¼	63⅝	63½	63⅞	64	730	730½	731	731½
11	195	195¼	195⅝	196	70	70½	72	72¼	62⅝	62½	63½	63¼	730	730½	730½	731
14	197¾	198¼	198¾	199	69⅝	69½	71½	71⅝	62	62½	63	63¼	730	731	731	731½
15	198½	198¾	199½	199¾	69⅝	69½	72	72½	62½	62⅝	64	64¼	730½	731	732	732½
16	200½	200¾	201¼	201½	72	72¼	73½	73¼	65¼	65⅜	65¾	66	730½	731	733½	734
17	204½	205	205¼	205½	73	73¼	74¼	74½	65¼	65½	65⅝	66	735	735½	738	738½
18	202	202½	203	203½	71¼	71½	72⅝	73	63¾	64¼	64½	64¾	733½	734	738½	739
21	201¾	202¼	202¾	203	70¾	71	72⅝	72½	63⅝	63⅞	64⅝	64½	730½	731	733	733½
22	204½	204½	205	205¼	71⅝	72¼	73¼	73½	64¼	64½	65	65¼	731½	732	734½	735
23	203½	203¾	204	204¼	71¼	71½	72⅞	73	63¾	63⅞	64½	64⅝	731	731½	734	734½
24	203½	204	204¼	204¾	71½	71⅝	72¾	73	63¼	63¾	64¼	64½	732	732½	735	735½
25	203	203¼	203½	203¾	71½	71⅝	72⅞	73	63½	63⅝	64½	64⅝	734½	735	739	740
28	203	203¼	203½	203¾	70½	70¾	72¼	72½	63½	63¾	64⅝	64½	731½	732	735	735½
29	205¼	205½	205½	205¾	71	71¼	72½	72¾	64	64¼	64⅝	64¾	730½	731	734	735
30	205¾	206	205¾	206	71¾	71½	72⅝	72¾	64½	64¼	64¾	64½	730½	731	734	734½
31	207½	207½	207¼	207½	71¾	72	72⅞	73	64½	65	65¼	65¾	730	730½	733	733½
Av'g's	£199.815		£200.582		£71.484		£72.959		£63.598		£64.274		£731.217		£733.207	

Prices are for the official a.m. session in pounds sterling per ton of 2240 lb. Copper basis wire bars, lead 99.97%, zinc 98% and tin min. 99.75%.

Miscellaneous Metals, Ores, Minerals

Quotations cover wholesale lots, prompt shipments f.o.b. New York unless otherwise stated. tons of 2,000 lb. unless otherwise noted. St—short ton; lt—long ton. (p) duty paid.

MISCELLANEOUS METALS

July 31, 1958

Aluminum ingot, 99 plus % lb.		26.1¢
Antimony, spot, lb. less than carload, in cases		32.59¢
In bulk, carload lots, f.o.b. Laredo		29.00¢
Imported, 10 ton min, (p), 99½%		23¢
Bismuth, ton lots, lb.		$2.25
Cadmium, commercial sticks, delivered, lb.		$1.55
Calcium, lb. ton lots, 98%, cast		$2.05
Chromium, 97% grade, lb. contract del.		$1.29
Cobalt, 97 to 99%, per lb. eff. Feb. 1, 1957		$2.00
Germanium, per gram, 10,000 gram lots	(a) 37¢—(b) 40.2¢	
Indium, troy oz.	$1.25 @	$2.25
Lithium, lb. 98%	$9.00 @	$11.00
Nickel, cathodes, lb (a)		74¢
Other sales, reg. sellers		74¢
Sales by dealers, etc.		74¢
Magnesium, 99.8% carloads, lb. producer's plants, Velasco, Texas, eff. Apr. 16		35¼¢
Palladium, troy oz.	$15.00 @	$17.00
Platinum (wholesale lots), troy oz.	$58 @	$65
Quicksilver, flask of 76 lb., 25 flasks or more	$233 @	$236
Selenium, 99 plus %, lb—(Feb. 19, 1958)		$7.00
Silicon, minimum 97%, carloads, lb.		21¢
Semi-Conductor grade, lb.		$350
Tellurium, lb.		$1.65
Thallium, 100 lb. or more, lb.		$7.50
Titanium, 99.3 plus, grade A-1, max. 3% iron, lb. (b)		$2.05

(a) Eff. Dec. 6, 1956; incl. U. S. duty; (b) Effective April 1, 1958. (c) Delivered; (d) f.o.b. plant.

METALLIC ORES

Beryllium Ore, imported, 10% BeO, per short ton unit	(a) $31.00 @	$33.00
Chrome Ore per long ton, f.o.b. cars Atl. ports, dry:		
44% Cr_2O_3 no ratio	$22 @	$23
48% Cr_2O_3 3 to 1 ratio	$44 @	$55
Iron Ore, Lake Superior, Lower Lake ports, long ton:		
Old Range bessemer		$11.35(e)
Mesabi bessemer		$11.60(e)
Mesabi, non-bessemer		$11.45(e)
Lead (Galena), 80%, Joplin, Mo., ton		$127.32
Manganese Ore—Per long ton unit of Mn basis 48% manganese, nearby positions, subject to premiums and penalties, c.l.f. U. S. ports, import duty extra, export duty included $1.05 @ $1.10; both duties excluded, $.915 @ $.965. Long-term contract nominal.		
Molybdenum Ore, 90%, per lb. of Mo f.o.b. mines	$1.18 @	$1.23
Columbium-Tantalum . per lb., combined oxides 10 to 1 ratio	$1.05 @	$1.10
Tungsten Ore, per stu of WO₃:		
Foreign 60%, c.l.f. U. S. ports, duty extra	$8 @	$10
U. S. scheelite, f.o.b. mill	$17 @	(a)$22
Vanadium Ore, per lb. of contained V_2O_5 f.o.b. mines		31¢
Zinc Ore, Prime, 60% concentrate, Joplin, Mo., per ton.		$56

(a) Nominal. (e) Eff. 1958 shipping season.

METALLIC COMPOUNDS

Arsenous Oxide (arsenic trioxide) lb., in bbl. carload lots delivered		5¼¢
Cobalt Oxide, 72¼% to 73¼%, per lb. eff. Dec. 1, '56	$1.52 @	$1.55
Copper Sulphate, 100 lb eff. July 2, '58		$11.05
Germanium Oxide, gram		27½¢
Molybdic trioxide, technical, per lb. of Mo	1.38 @	$1.41
Imported, incl. 37¢ duty	.73 @	$2.03

ALLOYS

Ferrochrome 65 to 70%, per lb. of Cr. (4-9% C)		28¾¢
Ferromanganese, 74 to 76%, per lb., shipg. pt.		12¼¢
Ferromolybdenum, 58 to 64% Mo, lb. of Mo contained	$1.68 @	$1.74
Ferrosilicon, 50% per lb. of Si f.o.b. shipping point (3-19-57)		14.20
Ferrotungsten, 72 to 82%, lb. of W contained		$2.15
Ferrovanadium, per lb. of V delivered	$3.20 @	$3.40
Silicomanganese, max. 1½% carbon, lb., contracts		12.8¢
Spiegeleisen, per long ton, 10 @ 21% grade eff. Jan. 7		$102.50

NON-METALLIC MINERALS

Asbestos, f.o.b. Canada (Quebec) mines (Canadian funds) ton:		
Crude No. 1	$1,470 @	$1,810
Crude No. 2	$788 @	$1,155
Spinning fibers	$353 @	$593
Shingle fibers	$190 @	$220
Paper stock	$120 @	$142
Waste	$82 @	$86
Shorts	$27 @	$75
Asbestos, f.o.b., Vancouver, B. C. (Canadian funds):		
Crude No. 1		$1,522
Spinning fibers	$494 @	$787
Shingle fibers	$142 @	$325
Asbestos, Vermont, f.o.b. Hyde Park:		
Spinning fibers	$353 @	$383
Shingle stock	$172 @	$190
Paper stock	$114 @	$145
Waste, stucco or plaster		$82
Refuse or Shorts	$39 @	$72
Barytes f.o.b. cars:		
Georgia, crude, per ton		$18
Missouri, 94% $BaSO_4$, per short ton	$16 @	$18
Crude oil well grade, min. 4.3% sp. gravity, st (a)		$18
Imported, c.l.f. Gulf Ports, st	$16 @	$18
Bauxite, long ton, f.o.b. point of shipment:		
Domestic, crude, 50 to 52% (not dried)	(c)$ 5.00 @	$5.50
Domestic, chemical, 55 to 58%	(c)$ 8.00 @	$8.50
Domestic, abrasive, 80 to 84%	(c)$18.00 @	$18.50
Imported metallurgical, per lt, f.o.b. Br. Guiana, dep. on grade		$7.14
Feldspar, bulk ton:		
Potash or soda feldspar, 200 mesh, ceramic grade	$18.50 @	$22.50
Glass feldspar, white, 20 mesh	$10 @	$12.50
Fluorspar, f.o.b. mines, bulk, 72½% effective, ton	$37 @	$41
60% effective CaF_2	$33 @	$36.50
Acid 97% concentrate, bulk, ton (eff. 12-1-56)		$50.00
Fuller's earth, f.o.b. Georgia or Florida, ton	$7.00 @	$14.00
Magnesite, per ton dead-burned, bulk, f.o.b. Washington		$46
Mica—Domestic, f.o.b. mines. Punch 7¢ to 12¢ per lb. according to size and quality. Sheet clear, 1½ x 2-inch, 70¢ to $1.10; 2 x 2-inch, $1.10 to $1.60; 2 x 3-inch, $1.60 @ $2.10; 3 x 3-inch, $1.80 @ $2.30; 3 x 4-inch, $2.00 @ $2.60; 3 x 5-inch, $2.60 @ $3.00; 4 x 6-inch, $2.75 @ $4.00; 6 x 8-inch, $4.00 @ $8.00. Wet ground, very fine, $140 @ $155 per ton. Bulk sales, dry ground; $30 @ $55 per ton. Scrap, $20 @ $30.		
Ocher, Georgia, ton, in sacks	$26.50 @	$32.00
Pyrites, Spanish, per long ton unit of S. c.l.f. atlantic ports		Not quoted
Sulphur, per lt, f.o.b. U. S. mines: bright		$23.50
dark		$23.50
Mexican, for use in Mexico, per metric ton, f.o.b. mines, 280 to 395 pesos, depending on use	$22.40 @	$31.60
For export f.o.b. vessel, lt, dep. on grade	$22 @	$24
Talc, f.o.b. works, ton:		
New York, purified	$18.00 @	$20.00
Vermont, extra fine		$12.50
Tripoli, Missouri, ton:		
40-mesh, cream colored		$50.00

(a) Some restricted sales at $11.50. (b) Corrected. (c) Nominal.

IRON AND STEEL

Pig Iron, gross ton, basic, Valley Furnaces		$66.00
Steel, f.o.b. Pittsburgh, billets, net ton		$77.50
Structural shapes, Pa., Ala., etc, 100 lb.	$5.10 @	$5.275

27 TON pull test shows 4-way expansion of O-B Shell and Plug!

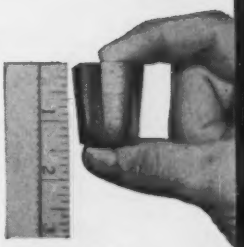
On the left, a plug from an O-B Bail-Type expansion unit. On the right, an identical plug after tensioning to 54,000 pounds — *6 times* the normal bolt load!

The test was made with a special bolt installed in a 1⅜ inch hole drilled in quartzite by an O-B customer operating a South African gold mine.

As shown in these unretouched pictures, the plug was compressed 22% and elongated over 30% by the tremendous pressures exerted against it. But, because those expansion pressures were distributed evenly four ways, reducing unit stresses to an absolute minimum, the O-B plug refused to break and release the bolt.

Four-way expansion is *another* reason why "they go up easy *and stay put!*"

OHIO BRASS COMPANY, MANSFIELD, OHIO
Canadian Ohio Brass Co. Ltd., Niagara Falls, Ont.



PLUG BEFORE TEST

PLUG AFTER TEST

4827-M

Ohio Brass

O B

SHELLS AND PLUGS

For Close-Quarter Work and Drilling Speed – the short overall length of the CP-555 Rotauger is perfect for drilling long blastholes in cramped quarters. The fast and powerful CP Rotauger can double your footage in the softer formations . . . drills 2½ inch holes in speeds of 2 to 4 ft. a minute to depths of 100 ft. or more.

There's a CP drill for every mining need!

For Complete Versatility – CP Integral and Attachable Airlegs teamed up with Chicago Pneumatic Sinkers get the most out of tungsten-carbide bits. The Attachable type is ideal for mounting standard sinkers for intermittent or production drilling; the Integral type is designed primarily for production drilling . . . both models in standard feeds of 36″ and 48″.

For Blast Hole and Exploratory Drilling – the powerful, lightweight, easy-to-handle CP-55 Diamond Core Drill is faster than any other diamond drill in its class. Has a highly efficient CP Rotary Air Motor . . . requires a minimum of air per foot drilled. Conservatively rated at 500 feet with E Rods and EX Fittings. Skid mounted types are available for test borings . . . rated in capacities to 2250 ft.

For Stoping and Raising – the CP-34 Stoper has just-the-right combination of piston speed, foot-pound blow, rotating speed and feed-leg pressure to achieve that extra long service and performance from tungsten-carbide bits.

Chicago Pneumatic *8 East 44th Street, New York 17, N. Y.*

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Why settle for less, when one of Caterpillar's modern heavy-duty Diesels will fit your needs?

Here's what some owners and users, who wouldn't settle for anything but CAT power, think of their diesels:

"As good an engine as I have ever seen!"
—Tim Fleming, co-owner, Fleming Coal Co., Wise, Va.

"These Cat Engines are economical to operate and don't break down!"
—G. W. Moore, owner of the Moore Coal Co., Wise, Va.

"Our Cat Engines are easy to maintain and have a long life span!"
—A. J. Schmidt, purchasing agent, the William Aloe Coal Co., Imperial, Pa.

"We get good all-around service from our Cat equipment, and from our Caterpillar Dealer!"
—Roy Coulson, division superintendent, Vitro Minerals Corp., Riverton, Wyoming.

This is typical of owner-user reaction to Cat Diesels. Hundreds of power unit combinations are available to match your specific loads. Cat Diesels are compact, and have a record of highly satisfactory use in all diesel applications throughout the world. And the dealer parts and service that stand behind them insure a minimum of down time.

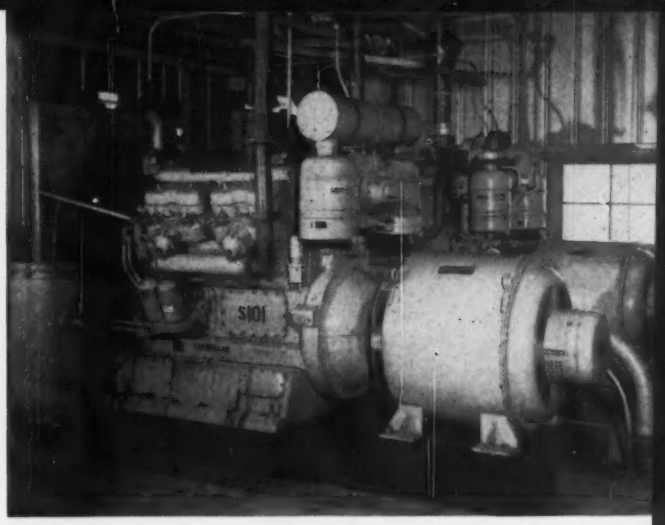
Each diesel reflects the very latest Caterpillar research, to up production and lower operating costs. Bulk has been eliminated, and extra power and longer life have been added through superior design and metallurgy. The fuel system of Cat Engines requires no adjustment. There are no cylinder ports to clean and Cat four-cycle design provides a smooth, efficient utilization of power. These and other features add up to new performance standards in diesel power.

So, for original power or repowering, it will pay you to specify Cat Diesels, available in over 150 other manufacturers' machines. And your nearby Caterpillar Dealer can solve your power problems and give you greater profits.

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U. S. A. Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

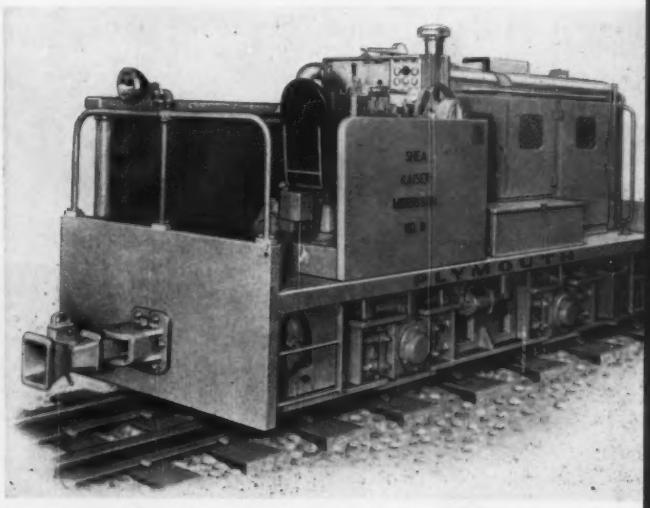
A Cat D397 Diesel furnishes power for this Lima shovel, and a D375 powers another shovel loading out slag from stockpile in Steelton, Pa., for C. J. Langenfelder & Son, Inc. Cat Engines are compact, and stand up in the rough shovel work.

Portable power can move with your job. Here a Cat D397 Mobile Electric Set supplies power for a shaft-sinking operation in uranium fields near Grants, New Mexico. Cat Mobile Electric Sets are dependable, easy to start, and easy to service.



When mining operations begin many companies rely on Cat Diesels. These D375s supply over 450 KW to power hoist, lights, ventilation and battery-charging equipment for underground uranium mine, where "second best" power won't do.

A Cat D318 Diesel Engine powers this Bucyrus-Erie shovel stripping overburden from clay deposits for cement manufacture. Owner of rig is Elmer Gower, Kunkletown, Pennsylvania. Cat engines provide dependable power for excavators.



One of a number of Cat Diesel powered Plymouth locomotives now serving underground on the Trinity River Project near Whiskeytown, California. Owned by Shea Kaiser Morrison, a Cat D326 (Series F) powers this model JL 15-ton unit.

ENGINE POWER BY CATERPILLAR

Engine Division, CATERPILLAR TRACTOR CO., Peoria, Illinois, U. S. A. **Dept. EM8**

Send me more information on Cat Engines.

- ☐ I am interested in general information.
- ☐ I would like the names of the 150 manufacturers who can supply Cat power in new equipment.
- ☐ I would like specific information about Cat Diesels for repowering.

*Name*_____

*Company*_____

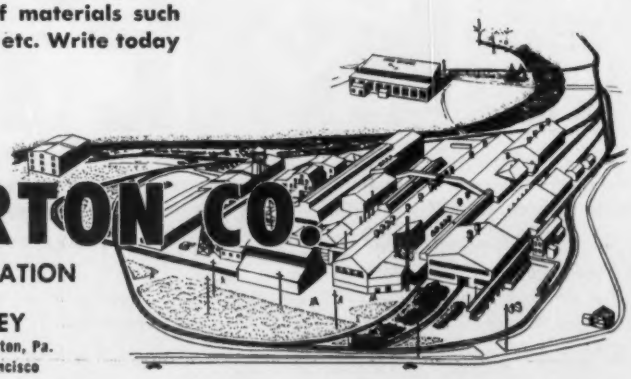
*Address*_____

*City*_____ *Zone*_____ *State*_____

16 PAGES PACKED FULL OF CHAIN DATA IS . . .

Yours for the asking

TISCO Manganese Steel Chain has no rival for long wear and rough use. All popular sizes and types of chain are shown for handling of materials such as ores, sand, gravel, pulp wood, etc. Write today for this complete FREE Catalog.



TAYLOR-WHARTON CO.

DIVISION OF HARSCO CORPORATION
Established 1742
HIGH BRIDGE 1, NEW JERSEY
PLANTS: Cincinnati, O. — Birmingham, Ala. — Easton, Pa.
SALES OFFICES: New York — Chicago — San Francisco

No. 8 in a series

Right off the Wire

About half of this country has been converted to dial telephones and it is expected that within five or ten years, it will be possible to dial Europe or the Hawaiian Islands.

Two new developments in "fiber optics" (the use of glass or plastic fibers to transmit light around curves) are in the examination of the inside of the human body and in cryptography.

A new plastic reinforced with silica withstands high temperature better than steel.

A new technique in the use of radar antennas which involves sweeping the beam will give them a range of 3,000 miles without increasing their size.

Simplex researchers, D. W. Kitchin and O. S. Pratt, have developed techniques for taking photomicrograph movies of polyethylene insulation failures caused by excessively-high voltages.

A thermo-electric engine, based on the temperature differential between dissimilar metal plates, converts atomic energy directly into electricity with a thermal efficiency of twelve per cent.

A new machine uses the light from atoms of mercury to control the engraving of lines on diffraction gratings which must be less than a wave length of light apart. Accuracy is closer than one-millionth of an inch.

The strength of cast iron and resistance to high temperature are combined with good electrical resistance in a new ceramic.

By using a clock based on the vibration of an atom of cesium, it has been found that the length of our day has been increasing half a thousandth of a second per year.

A new television picture tube has a front of double glass with mineral oil between. This increases light transmission by reducing reflection.

A two-volt booster battery is made to supplement a regular automobile battery. It is used only in starting.

Simplex ANHYDREX XX insulation has greater resistance to deterioration at elevated operating temperatures than any natural rubber of GR-S heat resisting insulation.

A ramjet power plant for permanent earth satellites has been designed which would obtain its power from the re-combination of oxygen atoms that have been divided by cosmic radiation in the higher altitudes.

Further information on these news items and on Simplex cable is available from any Simplex office. Please be specific in your requests.

An electron tube the size of a shirt button is made of layers of titanium and ceramic. It makes the tube competitive in size with the transistor.

An instrument for detecting radiation is said to be so sensitive that it can detect a thousandth of a gram of chromium 51 dissolved in a river.

A patent has been issued for a television set that shows two programs superimposed on one screen. The images are separated by polarizing glasses and individual earphones reproduce the sound.

A treatment for metal bearings is claimed to make it possible to run them indefinitely without lubrication. It has also been tested on power press tools.

A three-dimensional cathode-ray tube gives a display with a depth of one mile.

A steel roller for a new paper mill is said to be the largest in the world. It is over twenty-six feet long and is forty-four inches in diameter.

Submarine cables for railroad use!

Submarine cable is required by the New Haven R.R. for the power and control of 24 movable spans at 14 railroad bridges. Old style steel armored cable suffered the ravages of salt corrosion, strong currents and constant flexing, all of which resulted in high maintenance. Replacements, as required, are made with new Simplex submarine cable, jacketed in fabric-reinforced neoprene — a product of Simplex research — a remedy for delayed service and high maintenance costs.

SIMPLEX WIRE & CABLE CO.
Cambridge, Massachusetts and
Newington, New Hampshire

Simplex

Highest quality cables for: Mining
Power & Lighting • Construction
Transportation • Communications
Signalling

"The American manufacturers of transoceanic telephone cables"

Tire makers stress haul-road maintenance in recent booklets

"The better the haul road, the longer tires and units will operate without interruption, and the less the cost. Tire cost can be greatly reduced by keeping haul roads free from large stone, stumps, chuck holes, ledges, or any sharp or foreign substances that may injure or cut tires.

"Systematic, constant maintenance using motor graders or bulldozers keeps roads smooth and free from rocks. The cost will be more than repaid by the saving in tire and vehicle maintenance and by fewer service delays."

from "Off-the-Highway Tires"
(published by a leading tire firm)

* * * * *

"...the surface over which the vehicle operates is a very important factor in the total life of the tires — as well as the vehicle. Imbedded or loose rocks will decrease the speed of operation while vehicle breakdowns and maintenance costs go up. Improper drainage will cause mud and chuck holes that result in tire spinning, fast wear, cuts and fuel losses.

"These are but a few of the causes and effects of poor maintenance of haulage surfaces. Its importance cannot be overemphasized. While the cost of equipment and labor is high for maintaining the best possible hauling surface, the cost of delays, tires, and equipment repairs *is many times larger.*"

from "How to Get More Life from Tires on Off-Road Equipment"
(published by another tire-maker)

Here's how...

Good haul-road maintenance can be low-priced, because you can do it with the same fast, versatile machine that does *other* jobs for you. Just replace one of your present rigs with a unit that will do that machine's work and *maintain roads, too.* Here are three such machines:

Why better haul roads save you money

You can solve *some* hauling problems with new equipment . . . bigger, faster, more rugged units, like LeTourneau-Westinghouse Rear-Dumps. Another way to step-up your pit-to-plant tonnage and reduce per-ton costs is by keeping your haul roads in better shape. Here's how you benefit:

Faster speed . . . more trips per shift

First of all, on better roads, your haulers can travel 5 to 10 mph faster — therefore make more trips per shift. Operators will find they can haul in a higher gear, for greater fuel economy, less engine wear. You'll be able to inflate your tires by a few more pounds . . . for cooler running, less flexing, less wear. With higher inflation pressures, the load-bearing capacity of your tires increases, too. A 5-lb increase in pressure on some tires adds a ton-per-tire of load capacity!

On well-maintained roads you'll reduce spillage. One bad chuck hole can shake off a couple of hundred pounds of loose material from each high-heaped hauler. Multiply that by the number of trips you're running per day, and your loss proves costly. What's more, the rough, bouncy travel caused by poor roads makes their surfaces worse with each passing hauler.

Fewer repairs . . . longer unit life

Good roads help you save on repairs. Tires are less subject to cuts, cracks and abrasion. Your springs last longer. And when you eliminate deep ruts, pockets, chuck holes, and snags on your roads, you reduce jarring that can shake loose nuts, bolts, screws, and mountings . . . that can twist your hauler frame, and throw your whole rig out of alignment.

Stop mud, ice before it starts

With a planned and continuing program of road maintenance, you can provide proper drainage to keep water off and away from your roads. This licks most mud and ice problems before they start. Result: you'll have less weather delays . . . can work longer seasons, keep producing profitably more hours and days per year.

Finally, better haul roads add a big safety factor to your operation. Many a truck has been tipped or damaged by a deep hole or slippery shoulder. Bumps and jars slow down operations, diminish efficiency, cause undue operator fatigue — long before the shift is ended.

D Tournapull® is a 138 hp, 29 mph 2-wheel prime-mover on rubber tires, available with either a 9-yd scraper or an 11-ton Rear-Dump. Either way it's a fast, rugged hauler. Scraper makes an excellent one-man stripping crew . . . self-loads, hauls, spreads accurately, or grades surfaces . . . can also be push-loaded for maximum production at low-cost. Add a dozer blade to prime-mover and you've got a handy road-maintenance unit. It's ready to leave its hauling duties any time . . . to blade off your roads, spread aggregate or topsoil, do ditching or backsloping, leveling, backfilling, shoulder maintenance, or general grading.

Tournatractor® is a 210 hp rubber-tired tractor that *goes anywhere*, at 17 mph. This heavy-duty workhorse matches or exceeds crawlers in "push-power," except at rarely-used speeds under 2 mph. Because Tournatractor *speeds* around your pit or plant area twice as fast as most crawlers (a mile is less than 4 minutes away) this instant-shift, torque-converter unit can blade off roads several times a day . . . still handle "routine" tractor jobs. In many pits, one Tournatractor has replaced 2 or more crawler-type tractors . . . has increased production, yet proved it costs *less* to own and operate than a crawler with similar horsepower.

Adams* motor graders are available in six sizes, from 60 through 190 hp. They lead in better performance features in heavy-duty graders. Adams units have higher working speeds, higher travel speeds (to 26 mph). With "work power" attachments, this LeTourneau-Westinghouse product also handles many jobs. With *scarifier* you open-up clay, rock-filled soil, old roadways . . . with *push-plate* you pushload scrapers, start stubborn equipment. *Dozer* blade permits odd-lot casting, backfilling. *Jebco Elegrader* strips topsoil, loads dirt, stockpiles material, cleans ditches, builds up roads. Snow equipment handles snow removal.

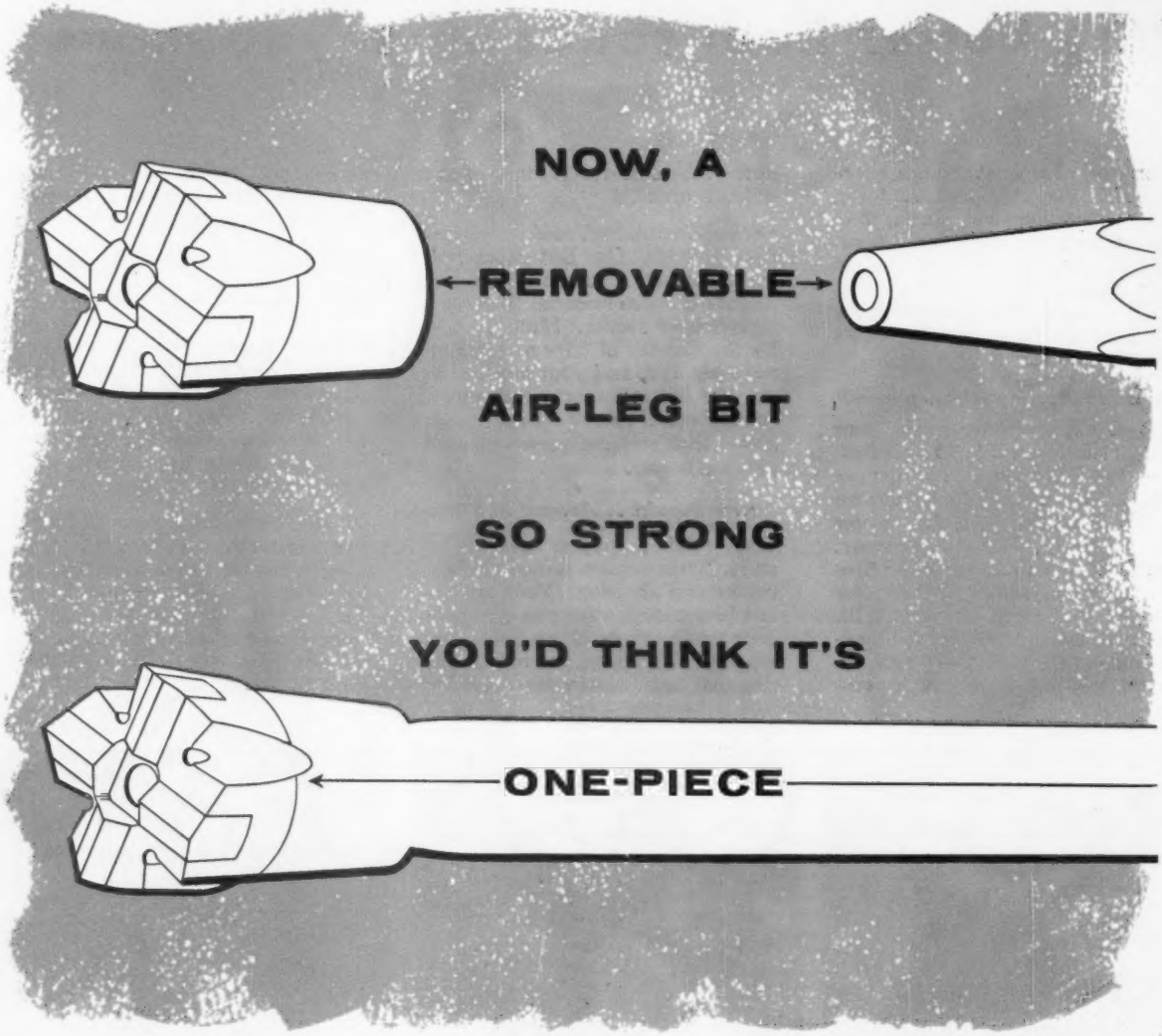
See or write us for further details on the why and how of road maintenance at your pit or quarry. We'll help you plan an effective, efficient, low-cost program.

*Trademark DPCTG-1644-MQ-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



THE new Timken® tapered socket bit for air-leg drills is removable —yet has the strength of one-piece steels. The tapered union gives you all the advantages of removability without the weaknesses that cause other removable bits to fail on air-legs.

Because the new Timken tapered socket bit is removable, you get all these advantages that intraset steels can't give:

You don't have to throw away the drill steel just because the carbides wear out. You do with intrasets.

You carry just a pocketful of bits into the mine. With intrasets you carry an armload of steel.

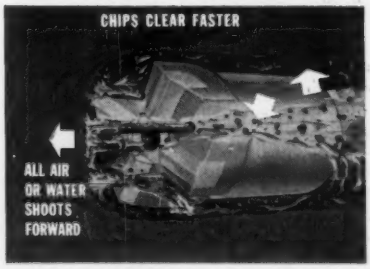
You can quickly change bit gauge sizes using the same steel. You have to change a whole steel with intrasets.

You don't have to lug the whole steel back to the shop to resharpen the cutting edges. You do with intrasets.

You get four carbide cutting edges, which insures longer gauge wear.

Two new frontal design features enable the Timken tapered bit to clear chips faster (see picture at right). And new special-analysis carbide inserts give superior wear-resistance with added shock-resistance. You can recondition them many times.

For removability *and* strength, use the new Timken tapered bit—the air-leg bit of the future. Write for free brochure. The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".



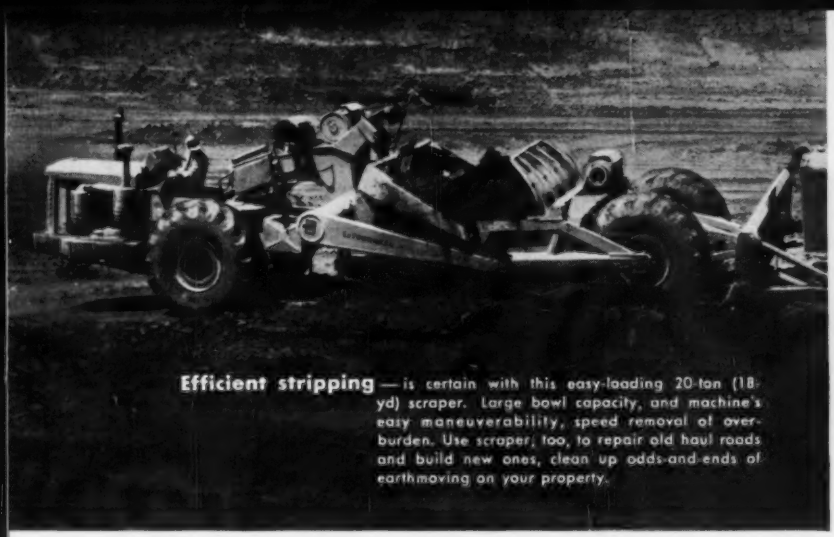
CHIPS CLEAR FASTER because 1) five front holes shoot water or air directly against the rock face and 2) deeper, wider wing clearance lets chips wash back faster.

TIMKEN

TRADE-MARK REG. U.S. PAT. OFF.

AVAILABLE NOW!

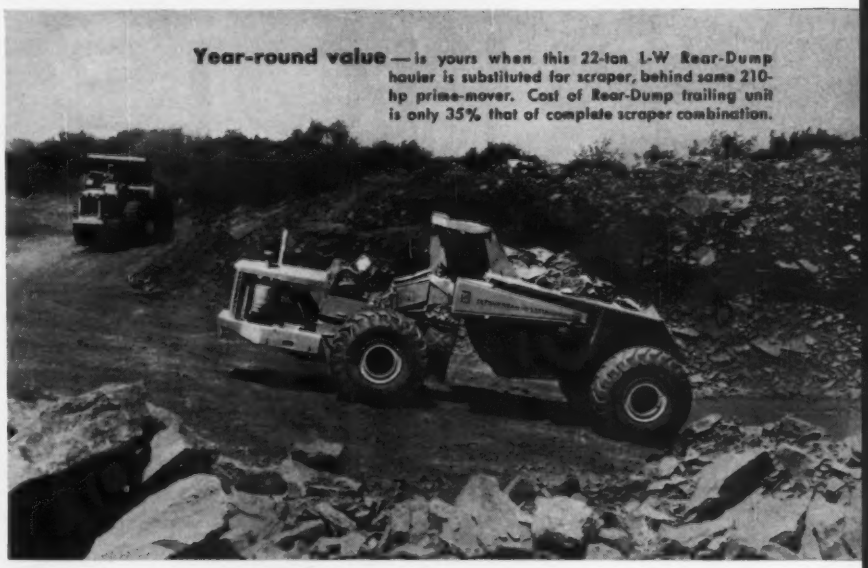
THE AIR-LEG BIT OF THE FUTURE



Efficient stripping — is certain with this easy-loading 20-ton (18-yd) scraper. Large bowl capacity, and machine's easy maneuverability, speed removal of overburden. Use scraper, too, to repair old haul roads and build new ones, clean up odds-and-ends of earthmoving on your property.

For shallow stripping, this scraper's your best bet

gives you year-round service with interchangeable L-W Rear-Dump



Year-round value — is yours when this 22-ton L-W Rear-Dump hauler is substituted for scraper, behind same 210-hp prime-mover. Cost of Rear-Dump trailing unit is only 35% that of complete scraper combination.

Time means money when you're stripping varying depths of overburden in your pit. If overburden is free of rock, and is shallow and wide-spread, crawler-type excavators — such as shovels, draglines and crawler dozers — move slowly to new work areas, increase your costs. Furthermore, they can only dig and cast . . . require other machines to haul spoil to out-of-the-way disposal areas.

Self-propelled scrapers move shallow, non-rocky overburden at lowest cost per ton. Since stripping is a periodic job, most scrapers are sidelined many days during the year because there is not enough steady work. Not so with LeTourneau-Westinghouse C Tournapull®. When you finish stripping, you simply interchange its 18-yd scraper for a 22-ton Rear-Dump trailing unit. Thus your 210-hp L-W prime-mover works productively for you all the year-round for greater profit.

Cost of the interchangeable hauler trail unit is only 35% of that of prime-mover and scraper combinations. Other interchangeable L-W work units include Bottom-Dump, Side-Dump, and Flatbed haulers.

Tournapull "extras" speed operations

All off-road L-W Tournapull units have easy maneuverability for work in restricted quarters, instant electric control of all work functions. They have powerful brakes (largest in the earthmover field), dependable power-steer, and exclusive, power-transfer differential which keeps these machines working in soft going when other haulers bog down.

All-around usefulness, and interchangeability of hauled units make L-W 'Pull† a sound investment for your pit. Ask for complete specifications, and a demonstration.

†Trademark CPCR-1867-MQ-1

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

This impressive installation at Kiruna, Sweden, demonstrates a major benefit of ASEA Multi-Rope Friction Hoists: *low initial installation cost.*

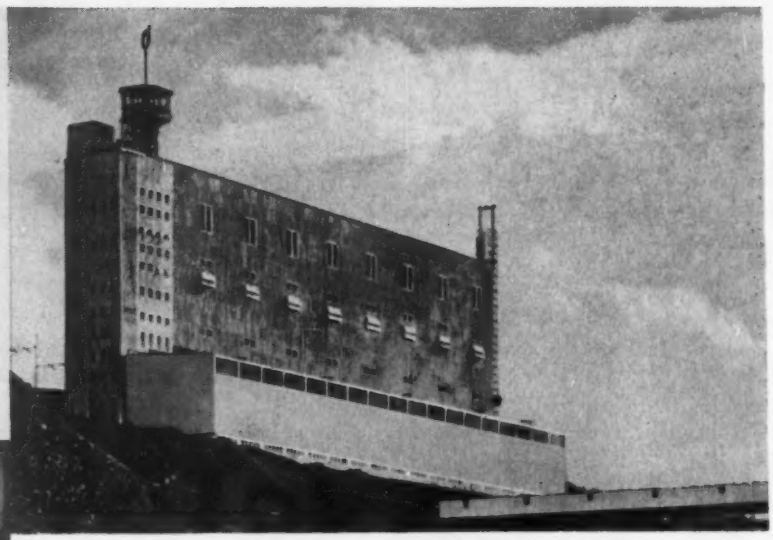
Each of these ASEA Hoists has a skipload of 22 tons and is designed for a depth of 1500 feet, maximum speed 2200 feet per minute.

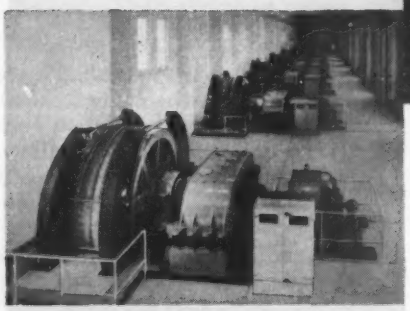
At Kiruna, as in mining operations throughout the world, ASEA Multi-Rope Hoists prove less costly to operate, safer, and they reduce rope wear.

In the U.S. these advantages may be seen in the ASEA installations of National Potash Co. and Cleveland Cliffs Iron Ore Co.

9 HOISTS IN ONE HEAD FRAME

Total capacity: 4600 tons per hour





FULLY AUTOMATIC, the ASEA Hoists at Kiruna eliminate the employment of hoist men.
At U.S. wage rates, assuming two-shift operation, this would mean a saving of about $30,000 yearly for each hoist!

Write for illustrated literature on ASEA Multi-Rope Friction-Drive Mine Hoists.

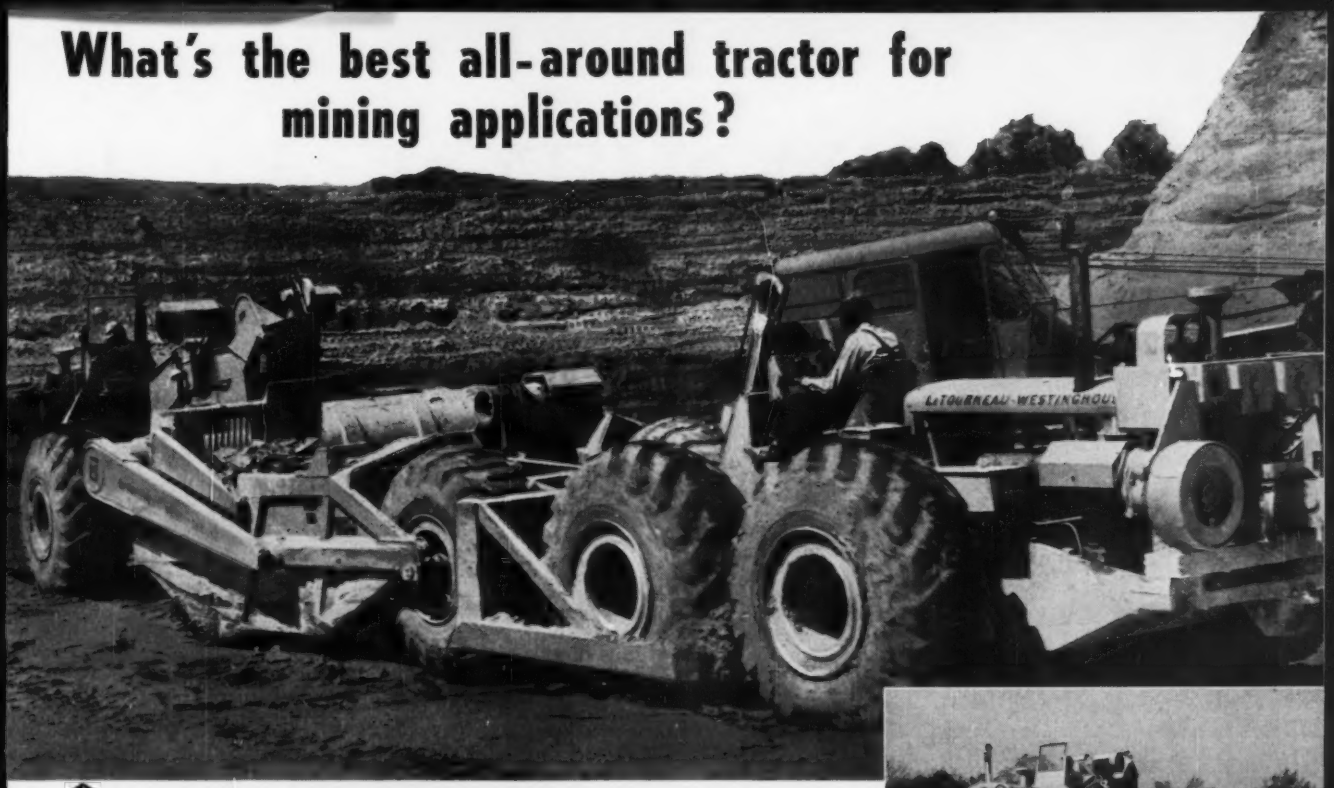
ASEA

World pioneer in electrical products for industry

U. S. Sales and Service:

ASEA ELECTRIC, INC.
formerly AROS ELECTRIC, INC.
500 FIFTH AVENUE, NEW YORK 36, N. Y.

What's the best all-around tractor for mining applications?



"Tournatractor can push-load two scrapers in the same time a crawler pushes one," says Supt. Jim Vaughn, of B & B Construction Co. Stripping overburden for M & M Clays, Inc.'s kaolin pit, rubber-tired tractors helped C Tournapulls load in just 48 seconds.

Wide, low-pressure tires gave good traction and flotation in wide variety of materials encountered on project. Other Tournapull features that helped speed production included 29.9 mph travel speed, exceptional maneuverability, instant-acting electric power system.

Ask A. S. Boone — whose B & B Construction Co. does a lot of contract stripping, mining, and hauling for clay operations in the "kaolin country" around Irwinton, Georgia. He'll give you strong arguments in favor of rubber-tired LeTourneau-Westinghouse Tournatractor®.

High crawler upkeep prompted switch to Tournatractor

B & B once used only crawler tractors. But when the firm's books showed that repair bills on 5 crawlers in 1 year totaled $30,000, Boone recalls, "It was time to look for tractors that would operate in sand, clay and water without high repair costs."

Two Model D Tournapull® scrapers B & B owned had cost only $450 in repairs for over 5000 hours of work. Because Boone and his men figured rock-bottom maintenance costs should run "in the family", they bought 2 new Tournatractors. Here's what's happened:

DOWNTIME: Tournatractor downtime has been only 10 days, compared to 30 per year *per crawler.*

LUBE TIME: B & B's work records show Tournatractor can be lubed in 5 minutes . . . far less than a crawler.

REPAIR COST: When the firm bought its 2 Tournatractors, it also purchased 4 C Tournapulls and a new crawler. *The maintenance cost of all 6 L-W machines has been approximately $4500, that of the one crawler approximately $2200.*

"Does work of 2 or 3 crawlers"

Has replacing 4 crawlers with only 2 rubber-tired tractors affected production? "Yes," says Boone, *"we get a lot more done!* Tournatractor does the work of 2 or 3 crawlers." For a sample of the kind of production B & B's getting nowadays, check the accompanying work report.

Tip: Why not take a close look at *your* crawler maintenance costs . . . then look at Tournatractor. Ask us for full details.

B & B's rubber-tired fleet strips 8,000 yds. a day

One of B & B's recent contracts involved stripping overburden at M & M Clays, Inc.'s kaolin pit at McIntyre, Ga. From top surface to kaolin, the 36' deep overburden included layers of clay-and-sand, pure sand, water-and-sand, and — just above the kaolin — a 3' layer of sticky gumbo. L-W Tournapulls, with Tournatractors pushing, kept production steady throughout the wide range of materials . . . clicked off 2290' cycles in an average of just 3.9 minutes.

C Tournapulls, with 18-yd. Fullpak* scrapers, pushed by husky Tournatractors, loaded in a hurry. Average load time was only 48 seconds; distance was 90'; and payloads averaged 11 to 12 yards of the heavy materials. When B & B used its full fleet of 4 C 'Pulls* and 2 Tournatractors, daily production averaged a big 8,000 cu. yds.

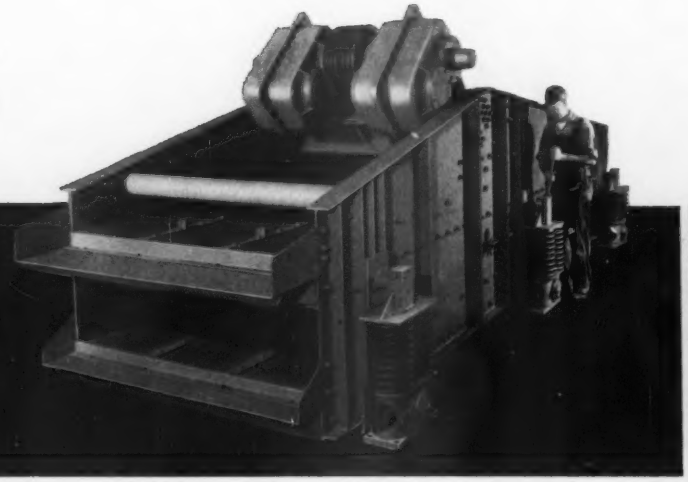
*Trademark CTCP-1573-MQJ-1

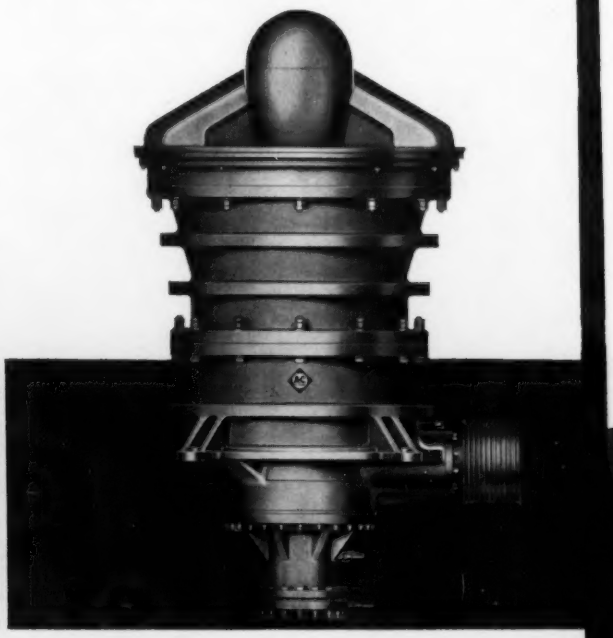
LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

The Modern Approach





"Coordineered" Equipment **for the Mining and Rock Products Industries**

Grinding mills — Whether your process calls for individual mills or a grouped-stage grinding series, Allis-Chalmers can make a right-for-the-job recommendation from seven types of grinding mills.

Vibrating screens — Allis-Chalmers screens are built in single or multiple-deck models for use in scalping, wet or dry sizing, washing, rinsing, dewatering and media recovery.

Gyratory crushers — "One-man, one-minute" product control slashes time required to change crusher settings from hours to seconds. Size adjustment, compensation for mantle wear, and emergency unloading are done at the flip of a switch.

"Work Index" Formula

This bulletin explains the "work index" formula — and how you can evaluate any size reduction operation. Compare efficiency of plants, circuits and machines. It offers the only practical approach for improving performance or determining the right machine for a job. Write for Bulletin 07R7995.

A-C ALLIS-CHALMERS

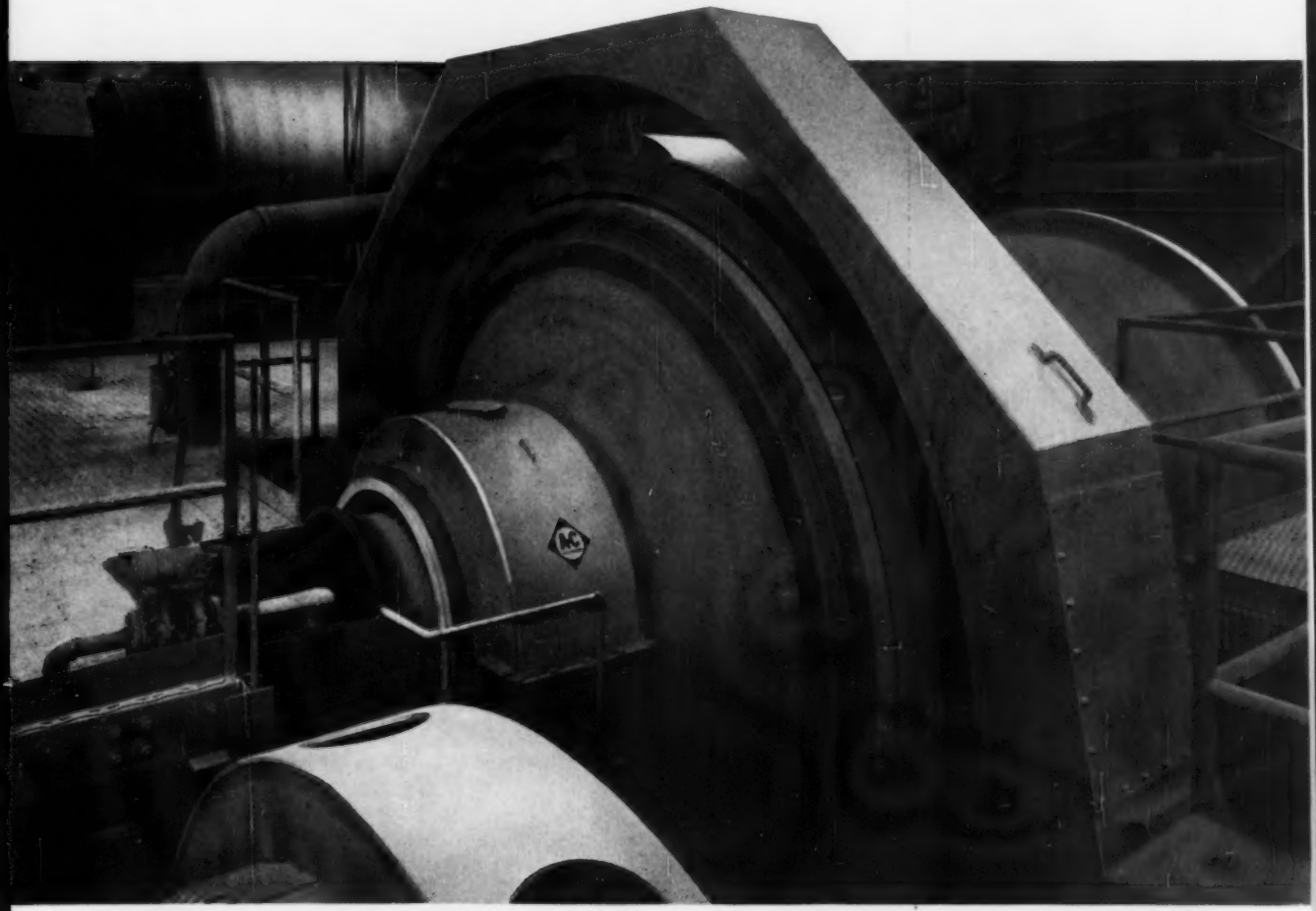
A-5659

to EFFICIENCY!

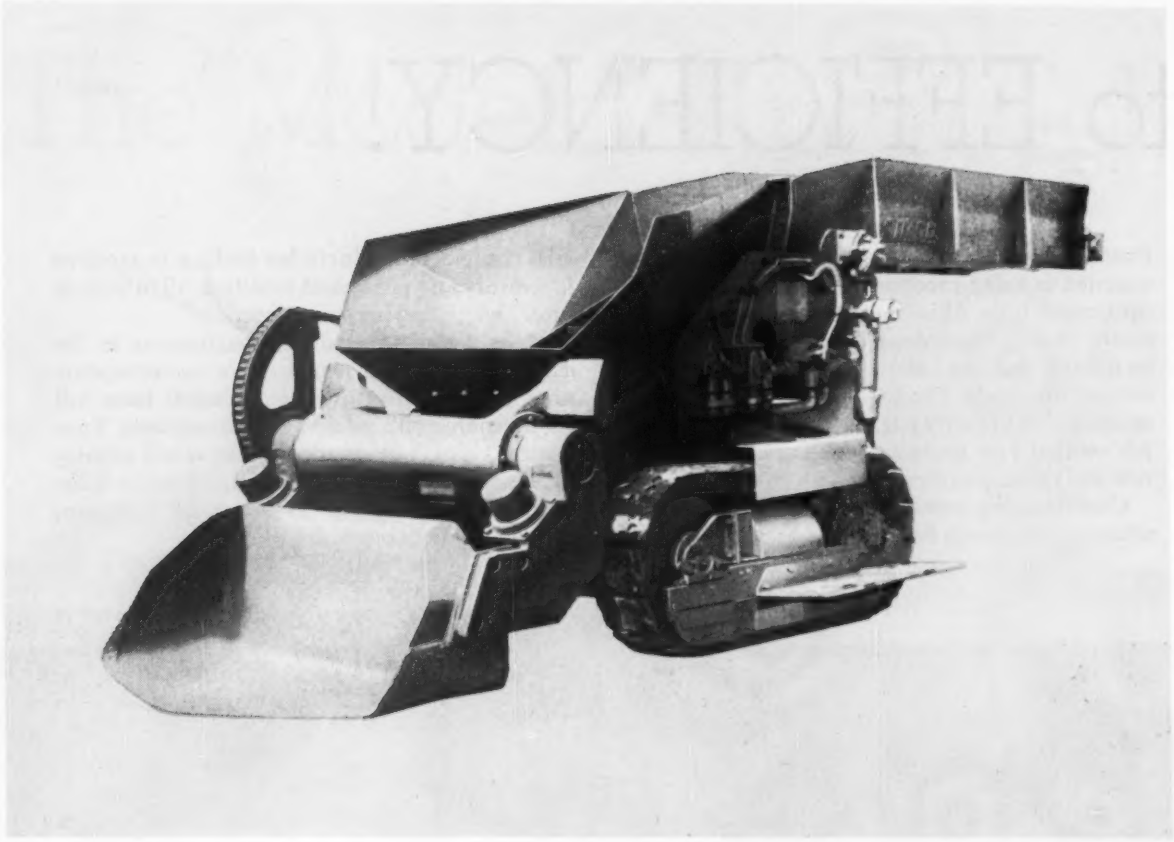
Practically every type of material mined or quarried is being processed by "Coordineered" equipment from Allis-Chalmers. Coordineering means that product departments work together on a single problem before equipment recommendations are made. Product experts make sure equipment is properly engineered for your specific job — that new units are integrated with both new and existing equipment.

Coordineering draws on Allis-Chalmers unparalleled experience in building and applying industrial equipment. It includes testing in modern laboratory and pilot plant facilities. All to provide profitable processing operations.

Make use of this valuable engineering in the early stages of your expansion or modernization program. An Allis-Chalmers technical team will gladly confer with you or your consultants. Your nearby Allis-Chalmers representative will arrange details. Get in touch with him, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.



ALLIS-CHALMERS



NEW LOW HEADROOM CONTINUOUS LOADER ON CRAWLERS

Eimco's new, fast-cycle, continuous loading machine with crawler tracks is the first of a new series of loading machines for which patent applications have been made.

These ideas represent the product of advanced engineering in loading machines that Eimco has been working on continuously for the past several years, and mark the introduction of completely different high-capacity, multipurpose, crawler type, conveyor discharge loader that will soon be available in capacities from 4 to 15 tons per minute

Now you can load long, large cars and trucks in a minimum headroom in the shortest time.

Eimco 635's are designed for the tough underground conditions experienced in hard rock mucking. They work equally well in sand, gravel, coal or other easier loading jobs. The wide bucket permits the handling of big rock and heavy loads. The steel pan conveyor moves the loads to heaped capacity and rapid discharge.

The conveyor is a heavy-duty steel flight type with abrassive resistant construction. The minimum storage capacity on the conveyor is 30 cubic feet.

Fast-cycle design enables the 635 to get its load with a minimum of forward movement of the crawlers.

Capacity of the 635 shown is approximately 4 tons per minute with either air or AC electric motors.

THE EIMCO CORPORATION

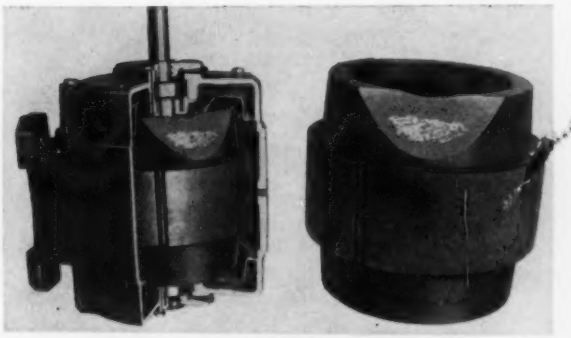
Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N.Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Pittsburgh, Pa. Seattle, Wash.
Cleveland, Ohio London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-337

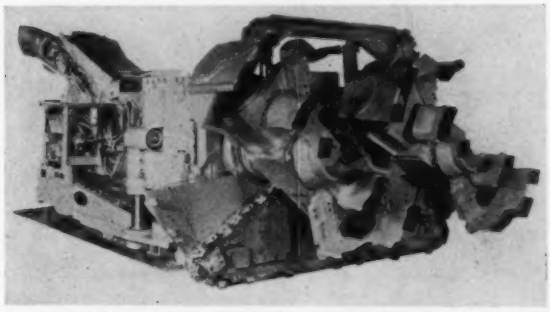
E&MJ NEW PRO[illegible]

In addition to these top new products and literature [illegible] check the feature article—"To Modernize, Choose Modern Mining Pro[illegible]g Equipment," p 89.



Motor Cast in Epoxy Resin Capsule (1)

Totally enclosed in a capsule of epoxy resin, Allis-Chalmers Mfg. Co.'s Super Seal line of motors are suitable for such severe use as outdoors, cooling towers, etc. Super-Seal will soon be available in all integral horsepower frame sizes in which random-wound coils are used.



Continuous Miner Reaches to 7½ Ft (2)

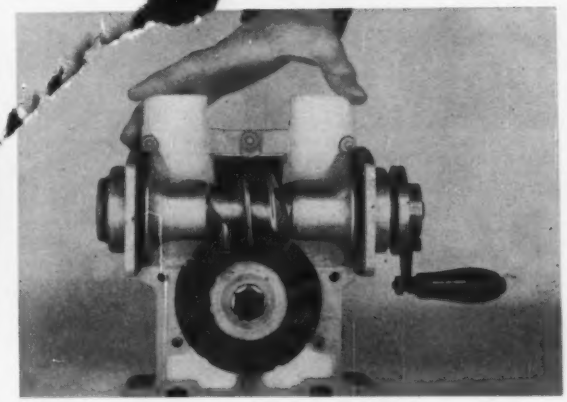
Boring type continuous miner with adjustable height range for coal as low as 5½ ft or as high as 7½ ft has been developed by Goodman Mfg. Co. Machine is powered by 250hp ac or dc motor and has 8 tons per minute cutting capacity. Unit will cut as wide as 13 ft on 7½ ft reach.

Vibrating, Oscillating Helical Spiral (6)

Helical spiral concentrator has been tested for some time on a wide range of minerals in South Africa, according to the *South African Mining & Engineering Journal*, and is now installed at a western Transvaal chrome mine. Developers claim that new device equals conventional spirals in product quality, while offering 7 to 10 times the capacity. Minerals Separation Co. (Pty) Ltd. will manufacture the machine which is 10 ft in dia and 11 ft high.

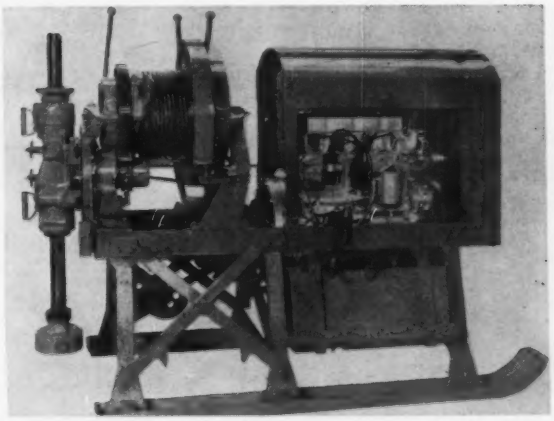
Spray Solution Protects Stockpiles (5)

Solution, called Compound SP, a blend of synthetic, organic long-chain polymers in a water base, forms a thin crust which is tough, durable and resistant to weathering. Compound is non-toxic, inert and without adverse effects on processing of ore or concentrate, says Johnson-March Corp.



Ancient Screw Principle Adapted to Pump (3)

An adaption of Archimedean lift pump, borrowing the screw principle, has been developed by Goodyear Pumps Ltd. Three sizes are available—1¼, 1½ and 2½ in. suction and discharge openings. Output ranges from 4½ to 167 gpm against heads of 50 to 200 ft. Larger sizes will be available soon. Goodyear's 1½ in. model weighs only 11 lb (8x4x9 in. size), yet can deliver 31 gpm against a 200 ft head on a 3.1 bhp prime mover.



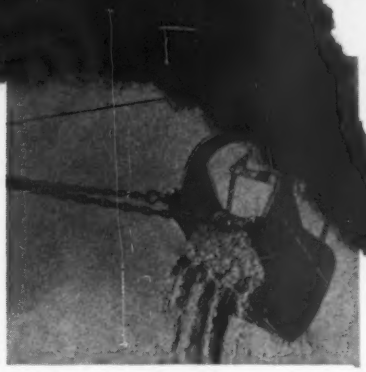
Surface Diamond Drill Has Bigger Motor (4)

Boyles Brothers Drilling Co., Ltd. says that Model BBS-2 is now powered by Hercules GO-226 88hp gasoline engine (3200 rpm) which offers greater fuel economy. Engine is interchangeable with diesel or air units. Drill will go to 3,500 ft.

Electric Heaters for Temporary Quarters (7)

Westinghouse Electric Corp. electric baseboard heaters were installed in temporary bunkhouses and buildings on a construction job at Thompson Falls, Mont., by Morrison-Knudsen Co. with excellent service says Westinghouse. Panels are easy to install.

For more information on new products and for copies of the literature circle the proper number on the New Products reply card, give your name and address, and mail card to *E&MJ*.



Automatic Dragline Bucket (8)

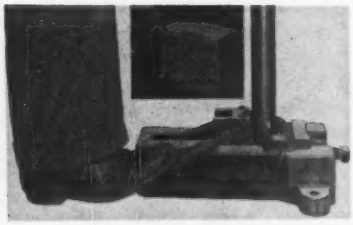
Designed for sand, gravel and quarrying operations, the new line of Page automatic dragline buckets are available in any size from ½ cubic yd and up, with or without perforations. According to Page Engineering Co., the new bucket has longer and higher basket as illustrated by the dotted line on the photo above.

Drill Rig Drive (9)

Westinghouse Electric Corp. offers a dc electric drive for drilling rigs with motors having intermittent ratings of 1600, 575 and 500hp; and generators with input ratings of 790, 590 and 270hp. Motors and generators are cooled by blower.

Resistivity Instrument (10)

Model 274M Michimho Vibroground soil resistivity instrument manufactured by Associated Research, Inc. is portable, simple to operate, accurate and rugged, according to the company. Device uses the Barnes Layer Method of interpretation.



Diamond Drill Clamps (11)

Safety clamp that can hold many sizes of diamond drill rods or casing with a single set of vee-shaped carbide-faced jaws has been developed by E. J. Longyear Co.

Electric Generators

High-speed synchronous generators in single bearing or two-bearing units, in rating from 30 to 150kw at 1800 rpm and from 50 to 300kw at 1200 rpm are available from Allis-Chalmers Mfg. Co. **(18)**

Packaged, portable, all-weather lightweight generator sets that develop 35kw are now available from Allis-Chalmers Mfg. Co. Model W-226. **(19)**

Extension Drill Steel (12)

Easily-coupled and fatigue-resistant 1½ and 2-in. cold rolled alloy extension drill steels with rope thread are being marketed by Atlas Copco. Rope thread—two threads to the inch—are easy to uncouple, says the company.

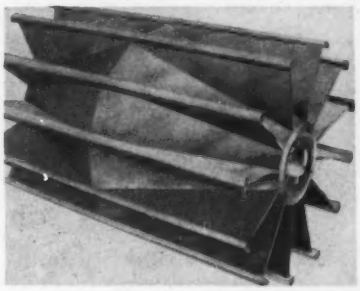
Trolleyphone (13)

Model 3000 Femco, Inc. Trolleyphone takes its power from an existing trolley wire or power line, either 250 or 550v dc. Current drain is ½ amp. Installations can also be made on 110 or 220v ac single or three-phase, or from 6 to 40v batteries.

Wire Rope Thimble (14)

Cast steel wire rope thimble with large radius to minimize rope bending is offered by Crosby-Laughlin Div., American Hoist & Derrick Co., for use with open sockets, wedge sockets and boom pendant clevis. Available for rope sizes from ½ to 1⅜ in. for use with pins from 1 to 2½ in. dia.

Conveyor Belt Pulleys



Welded steel wing-type self-cleaning pulleys with taper-lock hubs are the latest addition to Industrial Div., Continental Gin Co. material handling line. **(15)**

Curve-Crown pulley—round-rimmed with a single seam 100% welded inside and out—is produced by a new forming process according to Stephens-Adamson Mfg. Co. Squeeze-Lock hub design means no weldments between the hub and end plates. **(16)**

Crown or straight-faced pulleys can be furnished by Industrial Div., Continental Gin Co. from their line of welded-steel pulleys with Taper-Lock Hubs. **(17)**

Vertical Pump Motors (20)

Louis Allis Co. has designed the all-weather vertical, hollow shaft motor in ratings up to 2000hp for use in pumping applications.

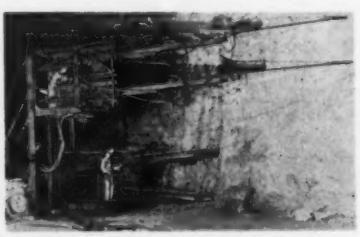
Compressors

Self-propelled air compressors in the 250 cfm class have been announced by Schramm, Inc. in their Model 250 Pneumatractor shown above. **(20)**

"World's largest portable compressor" says Le Roi Div., Westinghouse Air Brake Co. in describing their new 1200 cfm twin unit of two-state, oil-cooled, sliding vane design. Unit has two GM6-71 diesel engines and is wheeled. **(21)**

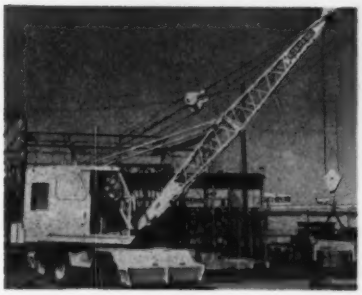
Heavy-duty rotary compressor with a standard capacity range of 800 to 13-000 cfm for air, gas or vapor has been announced by Fairbanks, Morse & Co. **(22)**

Stationary compressor—Model 25S2 from Le Roi Div., Westinghouse Air Brake Co.—is a small compact unit capable of continuous duty at 125 or 175 psi. Will deliver 120 cfm at 175 psi. **(23)**



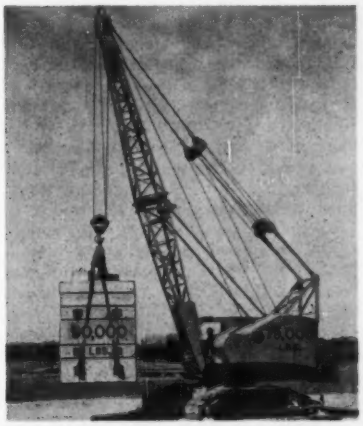
Mining Jumbos (43)

Winter-Weiss Co. has recently announced a complete line of one and two-man jumbos. Units have two drills on one-man, and four drills on two-man types. Jumbos may be truck, trailer or tractor mounted. Drifting jumbos are available for areas 30 ft or more wide with maximum patterns up to 60x27x15 ft. Benching and stoping rigs are also made.



Rubber-Tired Cranes (24)

Travel speeds of up to 18 mph are possible with Koehring Division's 25-ton lift capacity crane. Unit has 100-ft maximum boom; 15-30 ft jibs can be added.



Crane Lifts 45-Ton Loads (25)

Koehring Division's 545 Sprawler crane as shown above can lift 45 tons, which is 5½ tons more than it weighs. Special outriggers and pedestals fold back.

Bowl Scraper (26)

LeTourneau-Westinghouse Co. is introducing a new scraper which has 11.5 cubic yard capacity for use with tractors of 70hp or more. Unit is called DT Fullpak, and is smaller than LeT Models BT (27 yd) and CT (18 yd).

Safety Goggle (51)

Goggle frame is molded vinyl plastic molded to fit over prescription glasses, with a one-piece lens made of acetate (clear or green), and has indirect ventilation, says American Optical Co.

Bowl Scraper (27)

Continental-Wooldridge self-propelled bowl scraper Model CW 215 can haul 21 ton loads at up to 31 mph. Struck capacity is 15 cubic yd.

Trucks

Getman Scoot-Crete Ore Carrier CD-4 (4 cubic yd struck) has a length of 15½ ft, width of 8 ft, and height of 56 in. Unit has turning radius of 11½ ft, and is capable of reaching 15 mph forward or reverse. **(28)**

Lodestar Corp. has announced a semi-frameless aluminum dump trailer, 22 ft long, with 26 cubic yd capacity. Unit has hydraulic lift. **(29)**

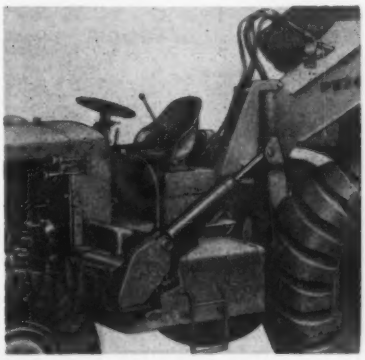
Truck Loader designed by M-B Corp. is a hydraulic self-loading bucket with attached hydraulic jaw that closes down to push material onto the bucket. (Jaw pulls down and holds). Will fit almost any truck. **(30)**

Wheeled and Crawler Tractors

Clamshell attachment is available for Pettibone Mulliken Corp.'s Speed Swing Loader with a maximum dumping height of 9 ft. Maximum digging depth is 10 ft. Buckets are available in 18, 24, 30 and 36 in. widths. **(32)**

Trojan T-18 tractor shovel is available with a choice of six bucket sizes—14, 16, 18, 20, 22 and 29 cubic ft capacity. Unit has 6 cylinder 72hp Chrysler engine says Yale & Towne Mfg. Co. **(33)**

As a result of heavier construction and more rugged components, Euclid Division's Model TC-12 Crawler Tractor's tare weight has been raised from 64,000 to 67,000 lb. Crawler now has 402 net delivered horsepower and two Torqmatic drives. **(34)**



Athey Products Corp. announces a Traction Booster attachment for the Caterpillar DW20. Unit transfers weight from the tractor steering axle and from the trailing unit axle to the driving wheels. Athey says that the booster imposes about 31% more weight on the driving wheels. **(31)**

Flat bed, 5-ton tilt-top trailers suitable for hauling Case Wheel and Terratrac crawler tractors can be hauled behind any pick-up truck, according to J. I. Case Co. **(35)**

Work Bull 1001 multi-purpose tractor loader, a Massey-Ferguson product, has ⅜ cubic yd shovel, no shift and instant reversing features. **(36)**

Hydraulic tilt-crown dozers, first installed on 80 and 100 hp Terratrac crawlers, is now available on 42 and 62hp models, according to J. I. Case Co. **(37)**

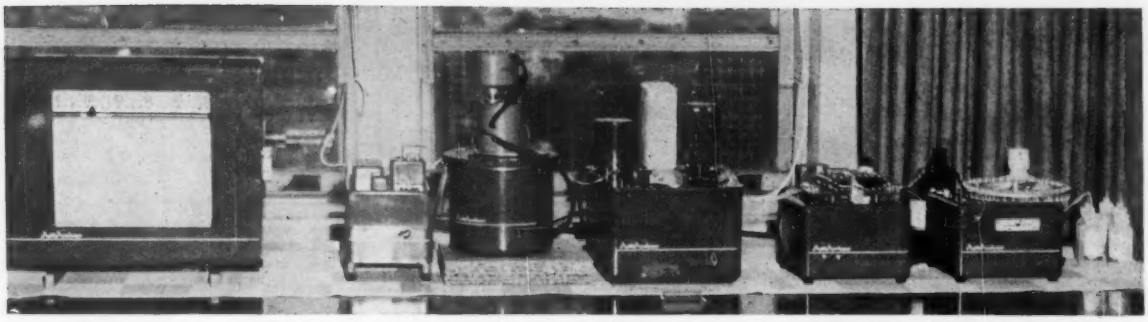
Napco Industries, Inc. Crab Tractor—4-wheel drive, 4-wheel steer—is illustrated in a 4-page bulletin. Tractor will move forward, reverse or oblique. **(38)**

Side dump bucket is now being made available for the Caterpillar Tractor Co.'s No. 977 Traxcavator (2½ cubic yd capacity). **(40)**

Payloader Model H-25 by Frank G. Hough Co. is a front end loader, rubber tired with a rated carrying capacity of 1¼ tons. Unit has 6 ft turning radius. **(41)**

Crawler Snowmobile (42)

For travelling in muskeg, soft or marshy land, rough ground or snow take a look at Bombardier Snowmobile Ltd.'s line of Muskeg Tractors and Four-Track Freighters. Tractor can be used as a drill rig in addition to transportation.



Recorder Colorimeter Heater Dialyzer Proportioning Pump and Sampler

Continuous System Provides Rapid Process Control and Research Analyses (49)

A system of analysis, with tremendous potential for the mineral processing industry, is currently being used to analyze and control process streams in the food, drug and fine chemical fields. It can analyze, report and control reagent additions and conditions within the process for any number of variables, and for any number of positions within the process. Technicon Instruments Corp. calls the system the Auto Analyzer.

A simplified system was demonstrated here in the McGraw-Hill building recently and consisted of the following components: (1) a constant proportioning, metering pump that takes separate, uniform samples of unknown, standard and reagent; (2) mixing coils; (3) a dialyzing membrane that takes an aliquot portion of the unknown-reagent and standard-reagent streams; (4) a heating coil; (5) a colorimeter which compares the unknown against the standard; (6) and a recording instrument which chalks up the results of each analysis. Auto Analyzer can determine up to 60 samples per hour. It can also be tied in with a feedback system so that the reagent additions to a process can be controlled by the analyses obtained. Also, analytical equipment other than the colorimeter can be added to the system—pH and temperature instruments, and a flame photometer—any instrument that can analyze a solution.

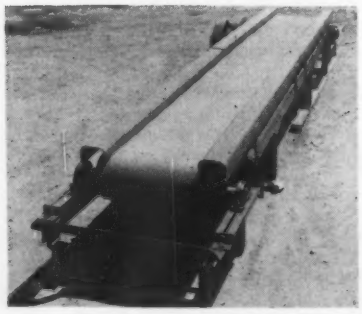
Results are obtained automatically, continuously without an attendant being present. Auto Analyzer is accurate to 1%. Results can be reproduced to an amazing degree of precision because sample size, time and temperature are constant, and because the unknown is being checked against a continuous stream of standard sample. Assays in parts per million are being recorded for many metals and free radicals—silica, phosphate, sulphate, gases, Cu, Ni, Co, Fe, U, Zn, Ag, Au, etc.

Where can it be used? Two situations come to mind immediately—flotation and solution processing. In flotation, the Auto Analyzer could be used to check and control reagent conditions for as many reagents and as many positions in the bank as desired. In solution processing—leaching, electrowinning or electrorefining, the Auto Analyzer can determine components in the solution.

Technicon says that they will demonstrate the system and show you what it can do for you in process control and research. They'll train your technicians and chemists at their laboratory.

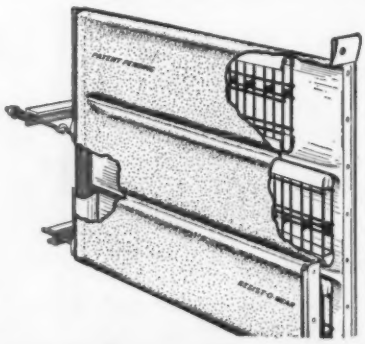
Boiler Lining Refractory (50)

Oceanite, a crystalline dense magnesia developed and tested for four years by Kaiser Chemical Div., Kaiser Aluminum & Chemical Corp., is capable of absorbing boiler slag while still retaining its refractory characteristics. When due for repairs, the Oceanite and slag crumble easily on cooling the boiler—no drilling and chipping needed.



Picking Belt-Table (47)

New conveyor is a slow moving, picking belt-table which has a variable speed arrangement, and rolled steel guards the full length of the table on each side. Table is portable says Hack Engineering Co. and Universal Dredge Mfg. Co.



Dust Collector Bags (53)

Resist-O-Wear three-section bags that give up to three times longer wear life are now standard equipment on all Sly Dynaclone dust filters, according to W. W. Sly Mfg. Co. Inner spacers and three-section design bags can be installed in all existing Sly collectors.

Temperature Alarm (52)

Electronic temperature control system shows green light at proper operating temperature, red light under, two red lights over, and sounds a buzzer when the current fails. Unit is sensitive to plus or minus 3 deg F, says Philadelphia Scientific Glass Co.

To Break Bin Bridging

Thayer Scale Corp. has developed a vibrating unit to break down bin bridging that does not agitate the bin walls, but the material contained. Unit operates through a vertical screen inside the bin (extending down to the opening). **(44)**

Pin-point action-type bin vibrators, suitable for bins and hoppers up to 14 cubic ft capacity, can be attached at the point of bridging, says Eriez Mfg. Co. **(45)**

Quiet type bin vibrators that release a cushioning screen of air ahead of the piston have been developed by Cleveland Vibrator Co. Air buffers the sound. **(46)**

Correction—Geochemical Test

Our apology to Canadian Industries Ltd. for incorrectly stating that C-I-L is making available the hydrogeochemical test kit mentioned on p 32, Mid-June *E&MJ*. This is not correct. The hydrogeochemical test kit was developed by Dr. Harry V. Warren and Dr. R. E. Delavault, University of British Columbia, Vancouver, B. C. If interested in details on the kit, may we suggest that you write to Dr. Warren or Dr. Delavault.

For Your Files

This selected manufacturers' literature is free unless otherwise specified. If item is for sale, send request and money direct to manufacturer.

TREAD MOUNTED LOADERS—Goodman Mfg. Co. 900 Series—are designed for loading coal, gypsum and potash at 8 to 10 tons per minute, according to 4-page catalog G-134. **(71)**

HYDRAULIC power-tilting and power-angling dozers are available on Case TerraTrac 42hp Model 320 crawlers, says J. I. Case Co. bulletin (CTS-112). 6pp. **(72)**

SELENIUM rectifier station-type battery chargers available from Syntron Co. are illustrated on a 2-page data sheet. **(73)**

LOCKERBASKETS for the modern changehouse are featured in Moore Co. 8-page bulletin (13b/Mo). **(74)**

VARIABLE SPEED motor control brochure from U.S. Electric Motors Inc. describes the Varitrol control system in 8 pages. **(75)**

LUBRICATING and electrical devices in the Trico Fuse Mfg. Co. line are presented in a 7-page condensed catalog. **(76)**

PIPE, FITTING AND VALVE catalog from Red Jacket Co., Inc. has been completely revised. **(77)**

APPLICATIONS of wire rope lubricant is the subject of catalog prepared by Whitmore Mfg. Co. Whitmore's lubricant is available in 16-oz aerosol bombs. **(78)**

REFRACTORIES available from Robinson Clay Product Co. are illustrated in a 20-page, full color catalog. Fire brick, cupola brick, ladle liners, castables, plastic fire brick, acid-proof cement, high-temperature mortar and kiln floor block and car tops are illustrated. **(79)**

CASTABLE REFRACTORY reference booklet prepared by Mexico Refractories Co. tells the proper application of 15 Mex-R-Co specialized cements. How to estimate quantity and suggestions for pneumatic placement are included. In color. 24pp. **(80)**

CONVEYOR IDLERS are described in Jeffrey Mfg. Co. bulletin 925, detailing the story on Permaseal idlers. 7pp. **(81)**

HANDY SLIDE RULE helps relieve the 20 most frequent conveyor belt headaches, according to U.S. Rubber Co. Conveyor belt trouble shooter is pocket size. **(82)**

PUMPS made by Worthington Corp. are illustrated in literature available from the company. These are centrifugal pumps in a wide variety of sizes and applications. **(83)**

PUMPS—the Vickers Inc. balanced vane design—are illustrated in a 4-page data sheet. Six capacities available (17.8 to 43 gpm). **(84)**

PUMPS made of ceramic alumina by General Ceramics Corp. designed for vacuum or compressor use, are illustrated in a 4-page brochure. **(85)**

MULTIPORT STEAM relief valves in the Cochrane Corp. line are illustrated in an 8-page bulletin (5200-A). **(86)**

FORGED STEEL globe valves designed by R-P&C Valve Div., American Chain & Cable Co., Inc. are illustrated in 4-page flier (DH-213). **(87)**

DUCTILE CAST IRON pipe fittings manufactured by Kuhns Brothers Co. are presented in an 8-page catalog (2-PF). **(88)**

TIME STUDY AID—the Calculagraph, an elapsed time computer developed by Calculagraph Co.—is described in a 4-page bulletin. **(89)**

CONTINUOUS CYANIDE and chrome waste treatment is the subject of Milton Roy Co. 4-page data sheet (D-58-1). **(90)**

CONTROL of chemical concentrations in process slurries by continuous titration—a 3-page paper on the Dow-Hart Titrator—is available from Milton Roy Co. **(91)**

NOMOGRAPH for sizing chemical feeders has been prepared by the Milton Roy Co. 3pp. **(92)**

FLOTATION FUNDAMENTALS booklet from Dow Chemical Co. is completely revised. 107pp. Spiral bound. **(93)**

TRAMP IRON magnet—Stearns Magnetic Products Indox Grate Magnet—is described in a 2-page flier. **(94)**

AIR CONDITIONERS in the AAF-Herman Nelson line are illustrated in American Air Filter Co., Inc. bulletin (786). 54pp. **(95)**

AUTOMATIC bagging scales from Richardson Scale Co. are presented in a 6-page bulletin (3749B). **(96)**

E&MJ NOT GOOD AFTER FEB. 1, 1959

Please send me the catalogs or further information about the items from New Products Digest whose numbers are circled. **AUG. 1958**

1	17	33	49	65	81	97
2	18	34	50	66	82	98
3	19	35	51	67	83	99
4	20	36	52	68	84	100
5	21	37	53	69	85	101
6	22	38	54	70	86	102
7	23	39	55	71	87	103
8	24	40	56	72	88	104
9	25	41	57	73	89	105
10	26	42	58	74	90	106
11	27	43	59	75	91	107
12	28	44	60	76	92	108
13	29	45	61	77	93	109
14	30	46	62	78	94	110
15	31	47	63	79	95	111
16	32	48	64	80	96	112

Name .....

Title .....

Company .....

Address .....

THIS IS *NOT* A POST CARD

Use this card for ordering reprints listed on reverse side of this page.

1. **Circle the numbers of the reprints you want on the reverse side of this card.**

2. **Enclose this card with the necessary remittance.**

3. **Put card and remittance in envelope and mail to:**

   Reprints Editor
   Engineering and Mining Journal
   330 W. 42nd Street
   New York 36, N. Y.

This card is for your convenience in ordering reprints. It is not a post card.

FIRST CLASS
PERMIT NO. 64
(Sec. 34.9 P.L.&R.)
NEW YORK, N. Y.

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in The United States

5¢ Postage Will Be Paid By—

McGRAW-HILL PUBLISHING COMPANY, INC.
ENGINEERING & MINING JOURNAL
330 WEST 42nd STREET
NEW YORK 36, N. Y.

E&MJ **AUGUST 1958**

Order Card for Reprints Only

Please send me the following reprints: (Circle the numbers of reprints which you wish to order)

R3	R211	R231	R504	R531	R620
R10	R214	R233	R505	R532	R621
R11	R215	R234	R506	R533	R622
R13	R221	R235	R511	R534	R702
R14	R222	R236	R517	R535	R705
R15	R223	R300	R521	R536	R900
R17	R224	R301	R522	R537	R901
R19	R225	R403	R523	R538	R902
R107	R227	R404	R526	R609	R903
R108	R228	R405	R528	R616	R1001
R109	R229	R501	R529	R618	R1002
R209	R230	R503	R530	R619	

My Name .....

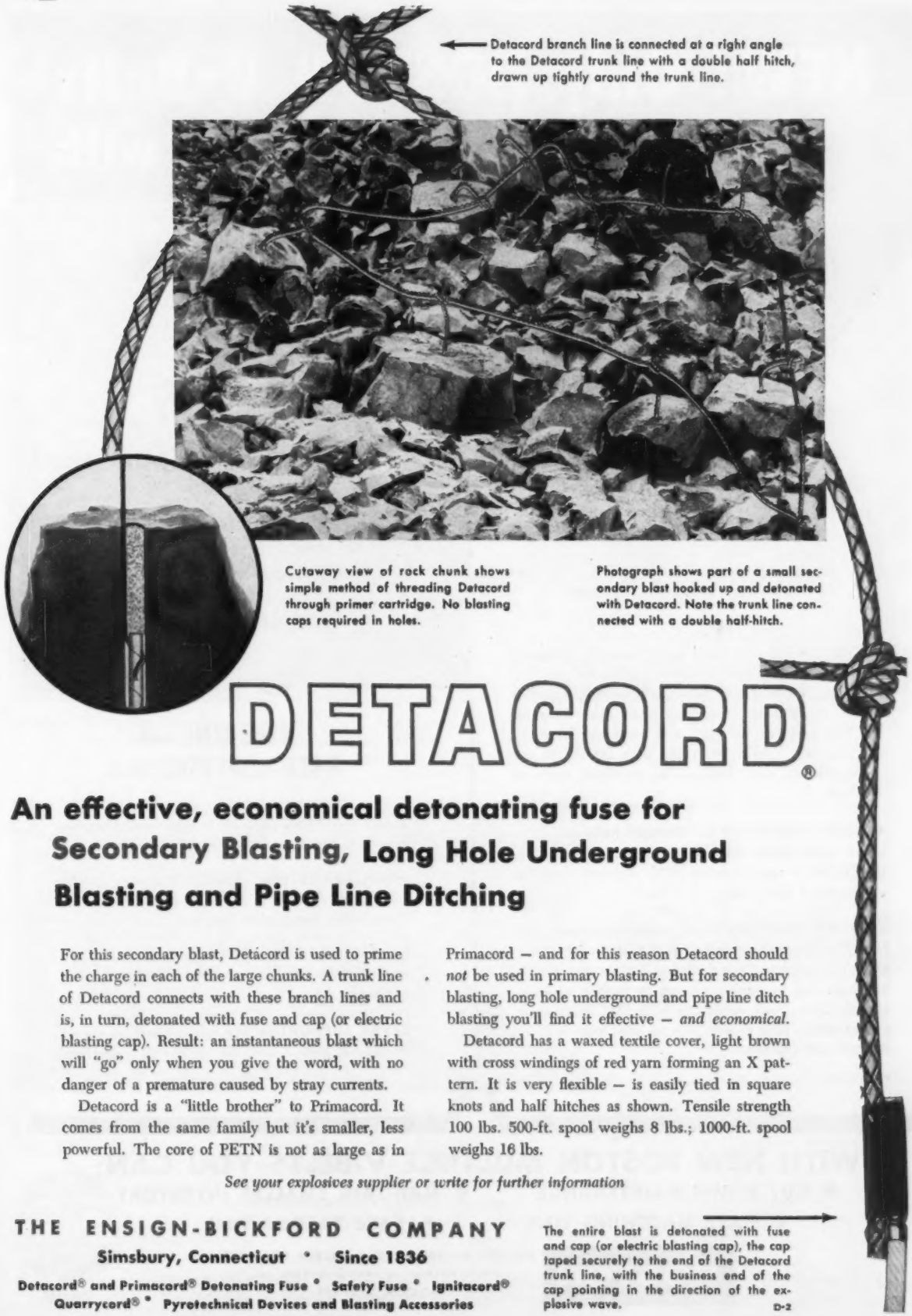
My Address .....

.....

Please enclose remittance with this card in envelope.

E&MJ REPRINTS AVAILABLE ——

No.	Title	Pages	Price per Copy
Uranium			
R3	How to Make Uranium Mining Pay More; Knoerr	12	30¢
R10	Uranium Jackpot; Meyers	4	15¢
R11	Utah's 1951 Uranium Mill; John A. Butler	8	20¢
R13	What Can Be Done About the "Uranium Milling Bottleneck?"	8	35¢
R14	Uranium Milling Forum	8	35¢
R15	Vitro's Keys to Successful Uranium Leaching; Huttl	8	35¢
R17	Feed Materials Production	8	35¢
R19 (R528)	The Vital Role of Ion Exchange in Uranium Production	8	35¢
Iron Ore			
R107	Teamwork on Taconite; Erie Mining Co.	24	50¢
R108	An Expert Looks at Iron Ore Sources in 1984	6	30¢
R109	Reserve's New Taconite Project	32	50¢
Commodities			
R209	Gold; M. A. Kriz	6	30¢
R211	Manganese and Titanium Spark Revival in Southern Nevada; Huttl	4	15¢
R214	World's Major Titanium Mine and Smelter Swing Into Full-Scale Production; Alvin W. Knoerr	12	30¢
R215	We'll Have to Plan Now to Meet Future Zinc Needs	8	20¢
R221	What the Future Holds for Titanium; H. H. Kellogg	16	50¢
R222	The Price of Copper 1955-1975; William P. Shea	8	35¢
R223	Lithium	16	50¢
R224	Thorium; Franklin, Elgo	8	35¢
R225	San Manuel America's Newest Large Copper Producer; A. W. Knoerr	32	50¢
R227	Solving the Practical Problems of Titanium Production; Mastin	12	40¢
R228	The Price of Lead 1956-1975; Wm. P. Shea	8	35¢
R229	New Era in Nickel	4	25¢
R230	Anaconda's New Aluminum Plant Now Producing at Rated Capacity; Smith	8	35¢
R231	Oxidized Copper	20	50¢
R233	Predicting Future Nickel Consumption; Lytton	6	30¢
R234	Nicaro Expands Nickel Capacity	12	40¢
R235	One Hundred Years of Zinc; Wm. P. Shea	4	25¢
R236	Aluminum; I. Lipkowitz	4	25¢
Foreign Surveys			
R300	Turkey's Mineral Potential Expands; Kromer	4	25¢
R301	Yugoslavia Seeks Mineral Development	6	30¢
"How To" Series			
R403	How to Operate a Drifter; Alvin W. Knoerr	4	15¢
R404	How to Operate a Stoper; A. W. Knoerr	8	15¢
R405	How to Operate a Flotation Machine, Thickener, Grinding Circuit	16	50¢
Metal and Mineral Processing			
R501	Brand New Plant for Secondary Smelting; Fadden	8	35¢
R503	What the Future Holds for Hydrometallurgy; N. Arbiter, H. H. Kellogg	8	20¢
R504	How to Use Quality Control to Improve Mill Production; Dorenfeld	4	15¢
R505	Three-Phase A.C. Can Improve Fine-Size Magnetic Separation; Sven Eketorp	4	15¢
R506	Hydrogen as a Reducing Agent; C. R. Hayward	4	15¢
R511	Ammonia; Ammonium Carbonate Leaching of Low Grade Oxidized Zinc Ores; William J. Wendt	8	20¢
R517	Extractive Metallurgy	6	20¢
R521	Where Ion Exchange Fits in Hydrometallurgy	8	35¢
R522	Wet Cyclone Eliminates Bottleneck Caused by Too Many Fines	4	25¢
R523	Making Rock Grind Itself	8	35¢
R526	How Synthetic Flocculants Help the Mill Operator	4	25¢
R528 (R19)	Vital Role of Ion Exchange in Uranium Production	8	35¢
R529	A New Look at Slag Fuming; Kellogg	4	25¢
R530	How FluoSolids Roasting Aids Gold Recovery at Dalny Mine; Rabone	8	35¢
R531	Bagdad Reports Metallurgical Test Results on Copper Recovery Method	4	25¢
R532	How to Determine Material Balance by Ratio-Scale Moments Method	1	25¢
R533	How to Select Your Conveyor Belt; Spoerl	16	50¢
R534	How the Inverted-Bosh Blast Furnace Increases Scrap Smelting Capacity	2	25¢
R535	Non-Cataracting Ball Mill Study; Myers	6	30¢
R536	Industry Looks at Direct Reduction; J. W. Franklin	12	50¢
R537	Electrons and Ions; J. W. Franklin	16	50¢
R538	Solvent Extraction and Resin-in-Pulp; Bitzer	12	50¢
Mining			
R609	Basic Break-Even Formulas Devised to Simplify Mine Evaluation	4	15¢
R616	Rotary Percussive Drill Studies Explain New Drilling Technique	6	30¢
R618	How Cross and Chisel Bits Compare in Performance	6	30¢
R619	How Homestake Meets Rising Costs	8	35¢
R620	Defense Against CO—The Silent Killer; R. D. Byrom	4	25¢
R621	Percussion Drill Steel Life, L. E. Antonides	8	35¢
R622	At Berkeley Pit, Blasting is an Art	4	25¢
Management			
R702	Operations Research and the Mine of Tomorrow; Ware. How Operations Research Solved the Dragline Problem	12	40¢
R705	The Important Problem Can Be Solved; A. Fletcher	4	25¢
Exploration			
R900	Prospecting and Developing Ore Deposits in Bedded Formation	16	50¢
R901	New Airborne Geophysical Method Speeds Prospecting	8	35¢
R902	Role of Geophysical Methods in Modern Exploration Programs; Brandt	8	35¢
R903	How the Nuclear Precession Magnetometer Aids Exploration	4	25¢
R1001	Mineral Economics Factbook	16	50¢
R1002	E&MJ's Flowsheet Design Book	16	50¢



Detacord branch line is connected at a right angle to the Detacord trunk line with a double half hitch, drawn up tightly around the trunk line.

Cutaway view of rock chunk shows simple method of threading Detacord through primer cartridge. No blasting caps required in holes.

Photograph shows part of a small secondary blast hooked up and detonated with Detacord. Note the trunk line connected with a double half-hitch.

DETACORD®

An effective, economical detonating fuse for Secondary Blasting, Long Hole Underground Blasting and Pipe Line Ditching

For this secondary blast, Detacord is used to prime the charge in each of the large chunks. A trunk line of Detacord connects with these branch lines and is, in turn, detonated with fuse and cap (or electric blasting cap). Result: an instantaneous blast which will "go" only when you give the word, with no danger of a premature caused by stray currents.

Detacord is a "little brother" to Primacord. It comes from the same family but it's smaller, less powerful. The core of PETN is not as large as in Primacord – and for this reason Detacord should *not* be used in primary blasting. But for secondary blasting, long hole underground and pipe line ditch blasting you'll find it effective – *and economical.*

Detacord has a waxed textile cover, light brown with cross windings of red yarn forming an X pattern. It is very flexible – is easily tied in square knots and half hitches as shown. Tensile strength 100 lbs. 500-ft. spool weighs 8 lbs.; 1000-ft. spool weighs 16 lbs.

See your explosives supplier or write for further information

THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut • Since 1836

Detacord® and Primacord® Detonating Fuse • Safety Fuse • Ignitacord® Quarrycord® • Pyrotechnical Devices and Blasting Accessories

The entire blast is detonated with fuse and cap (or electric blasting cap), the cap taped securely to the end of the Detacord trunk line, with the business end of the cap pointing in the direction of the explosive wave.

D-2

NEW! Only BOSTON V-Belts are made with

DACRON Tensile Members

plus

NEOPRENE with **FIBER-DISPERSED** Stock!

The industry's most advanced developments are now standard in the entire Boston Multiple V-Belt line!

DACRON Tensile Members

GREATER STABILITY — Changes in humidity — and the resulting moisture regain — often mean a matching problem with ordinary V-Belts. The moisture regain of DACRON* is low — 0.4% — or 1/20th that of the conventional reinforcing fiber. This means far less time spent in matching, and lower belt inventory too. Because V-Belts reinforced with DACRON are more uniform, each belt carries an equal share of the load.

HIGHER STRENGTH — Stronger belts can withstand more shock loading, need less maintenance. DACRON is approximately 40% stronger than the conventional fiber used in V-Belts.

STRETCH RESISTANCE — V-Belts reinforced with DACRON have low stretch. DACRON is inherently stretch-resistant and the cords are put through a special heat and tensioning process to further minimize stretch. Thus, belts reinforced with DACRON show comparatively little growth — even after many months of continued operation.

*DACRON — DuPont polyester fiber

NEOPRENE with FIBER-DISPERSED Stock

GREATER RESISTANCE to oils, heat, abrasion, chemicals and ozone is provided by Neoprene.

HIGH TRANSVERSE RIGIDITY is provided by the closely-packed, straight-line formation of the fibers in the compression member.

EXCEPTIONAL LONGITUDINAL FLEXIBILITY is provided by the virtually frictionless positioning of fibers.

EXTRA SUPPORT for the tensile members during shock-load impact and during normal operation.

WITH NEW BOSTON MULTIPLE V-BELTS YOU CAN:

- CUT DOWN MAINTENANCE
- MAINTAIN SMALLER INVENTORY
- SAVE MATCHING TIME
- SAVE TAKE-UP TIME

BOSTON

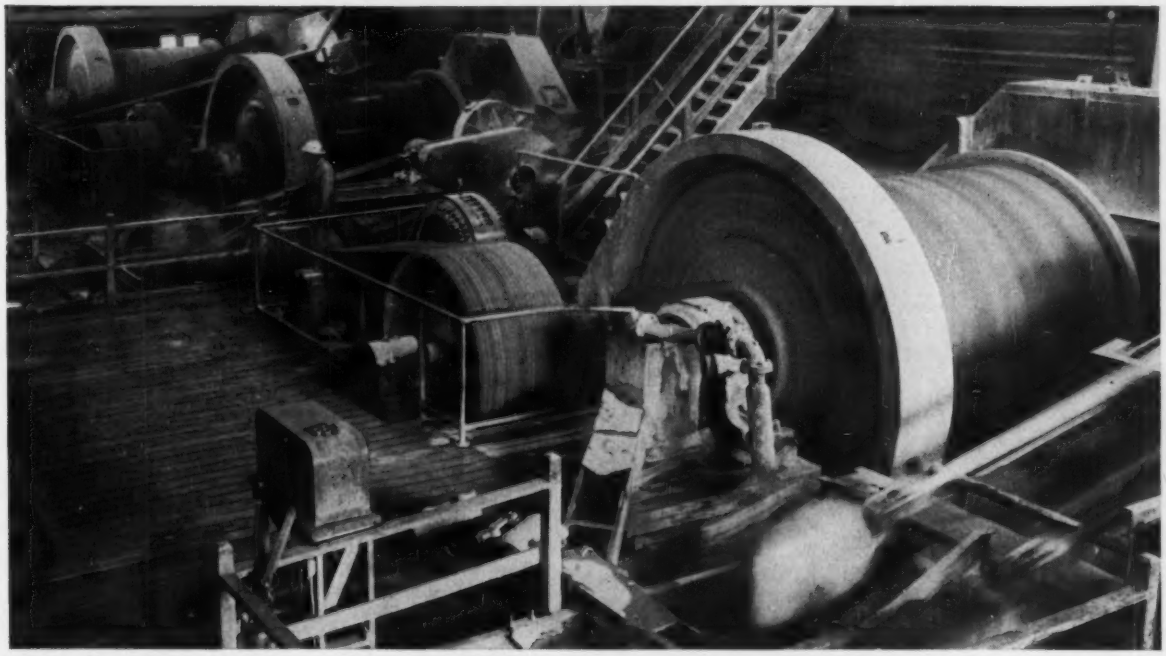
BOSTON WOVEN HOSE & RUBBER COMPANY
DIV. OF AMERICAN BILTRITE RUBBER CO., INC.
BOSTON 3, MASS.

ENGINEER'S FIELD REPORT

PRODUCT CHEVRON GEAR COMPOUND

FIRM BAGDAD COPPER CORP.
Bagdad, Arizona

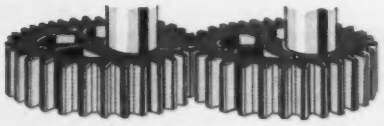
Not one gear failure using Chevron Gear Compound



During 5 years that Bagdad Copper Corp. has used Chevron Gear Compound (formerly Calol) in its ore concentrator mill, not a single gear has broken down, required repair or replacement as a result of lubricant failure. Despite continuous operation and extreme pressure, gear teeth show no scuffing or galling. Mill moves some 4,000 tons of ore through its four ball mills and classifiers every 24 hours.

Enclosed gears of firm's four Western Machinery classifiers are lubricated with Chevron Gear Compound. Copper ore is pulverized in ball mills by tumbling with 32 tons of 3" steel balls. Classifiers then screen out oversize pieces for return to ball mills. Reduction gear box which Master Mechanic Al Smith is inspecting (above) powers connecting arms which agitate mixture of pulverized ore and water in classifier.

Why Chevron Gear Compound protects enclosed gears



- Tough film protects gear teeth against scuffing and scoring under severe shock, load conditions.
- Highly adhesive...clings to gear teeth and bearings, even under wet operating conditions.
- Oiliness additive reduces friction

For More Information on this product contact your nearest representative, or write direct to any company listed.

CHEVRON Industrial Lubricants

TRADEMARK "CHEVRON" AND "CHEVRON" DESIGN REG. U.S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA,
225 Bush Street • San Francisco 20, California

THE CALIFORNIA COMPANY,
P. O. Box 780 • Denver 1, Colorado

STANDARD OIL COMPANY OF TEXAS
P. O. Box 862 • El Paso, Texas

HARBISON-WALKER

SOME LEADING H-W REFRACTORIES for COPPER furnaces

CHROMEX B

The desirable properties which account for the excellent service secured from this extra hard fired chrome-magnesite refractory are: —high density and impermeability—relatively low thermal expansion and good resistance to thermal shock—stability and strength at high temperatures. Among its important applications in copper furnaces are converter linings and walls and roofs of refining furnaces. It is used with excellent results in linings of electric copper melting furnaces.

THERMAG

This hard burned magnesite-chrome refractory possesses the chemical and physical properties which make it particularly suited for roofs of electric furnaces used for melting copper.

H-W MAGNESITE

For the most strongly basic linings, this refractory, consisting predominantly of periclase (stabilized crystalline magnesia), fulfills the most severe requirements. It is fired at an extremely high temperature and is dense, strong and volume-stable at temperatures above the highest employed in copper furnaces. The unusually high magnesia content of H-W MAGNESITE, together with its outstanding physical properties account for the wide preference this refractory continues to gain for use in various metallurgical furnaces.

METALKASE AND METALKASE XXP

Among basic refractories, Harbison-Walker METALKASE brick possess the property of maximum resistance to severe spalling conditions. METALKASE brick are furnished in various sizes and shapes. They are made in both chemically-bonded and hard fired basic refractories of various compositions which are widely used with particular benefit in suspended roofs and walls in the several types of metallurgical furnaces.

METALKASE XXP are chemically-bonded basic brick, formed under high pressure, with two internal plates. They are available in various compositions and in standard sizes, and suspended arch and other shapes.

STAR AND VEGA

These two superior silica brick now are made at seven widely separated Harbison-Walker plants. Shipments from these advantageous locations provide important savings in transportation time and cost.

STAR brand is regarded as standard for refining furnace bottoms and roofs at many plants. It is used in reverberatory Matte smelting furnace roofs and in a number of electric smelting furnaces of different designs.

VEGA is the original super-duty silica brick from which greatest benefit is derived in vulnerable positions where extremely severe operating conditions prevail.

for ALUMINUM furnaces

Refractories which are best suited for use in aluminum melting and holding furnaces possess properties which meet various specific requirements. In some furnaces the refractories in the bottoms are subjected to severe impact and abrasion. In the production of various alloys to meet certain rigid specifications, the refractories used must be such that any contamination, such as silicon pick-up, is avoided. High resistance to wetting and penetration by molten metal is paramount.

KORUNDAL

The unusual combination of desirable physical properties of this 90% alumina refractory makes it particularly adapted for use in bottoms and lower side walls. KORUNDAL is very strong and resistant to mechanical abuse, wetting by molten aluminum and to thermal spalling. This brand, made in modifications such as KORUNDAL DOT and KORUNDAL F, serves various specific needs to greatest advantage.

H-W SILICON CARBIDE

Some of the most important physical properties of this refractory are measurably enhanced by developments in manufacturing procedures. Many sizes and shapes are formed by impact under great pressure which accounts for increased density and strength. High temperature firing in a closely-controlled atmosphere contributes to the formation of an exceedingly impervious surface and lower permeability. It is unusually resistant to oxidation and wetting by molten metals and can be used in various furnace positions.

ALAMO

Along with other Harbison-Walker super-duty fireclay brick brands, ALAMO is favored for upper walls and roofs. Harbison-Walker products for aluminum furnaces comprise several other brands of high-alumina and high duty fireclay brick possessing the particular properties needed for best performance in this service.

BONDING MORTARS

HARWACO BOND (diaspore base), THERMOLITH (chrome base) and KORUNDAL BONDING MORTAR (stabilized alumina base), cold-setting high temperature mortars have unusually high strength for the temperature range of their use. While these may be used interchangeably for laying the various types of brick, each provides special benefits for particular applications.

H-W MONOLITHIC MATERIALS

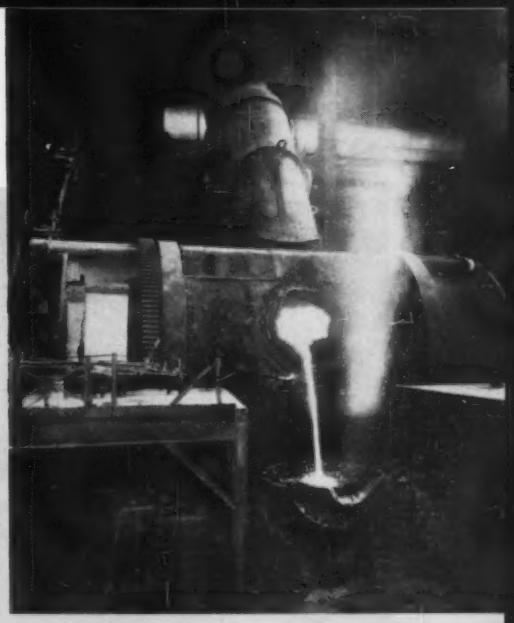
KORUNDAL RAMMING MIXTURE—H-W CHROME CASTABLE—H-W EXTRA STRENGTH CASTABLE and H-W PLASTIC FIRE BRICK among the full complement of Harbison-Walker monolithic refractories are especially adapted for aluminum furnaces. They are favored in this industry because of the pronounced properties of volume stability, low thermal expansion and high resistance to both penetration and abrasion.

H-W ZIRCON

This zirconium silicate refractory made by impact under high pressure in various rectangular sizes is exceedingly dense, impervious and resistant to wetting by molten aluminum. Because of its spendid workmanship, it can be laid with very thin joints of H-W ZIRCON BONDING MORTAR which is especially desirable for side wall construction.

REFRACTORIES

for dependable performance in every metallurgical operation



for OTHER NON-FERROUS furnaces

The service conditions in furnaces employed in the numerous non-ferrous metallurgical processes vary widely, and the refractories must meet highly specialized requirements. The selection of the proper refractory frequently governs the degree of success of the processes employed in the reduction, refining and melting of these metals. Harbison-Walker products comprise all the different types and classes of refractories needed for all the metallurgical processes, such as for the reduction and refining of nickel, lead, zinc, tin and other metals.

Extensive research and experience govern the selection of the particular Harbison-Walker refractories which serve best in metal chloride furnaces such as those used for making titanium and zirconium chlorides and for the production of metallic sodium and magnesium. Brands generally favored for these requirements are VARNON BF, H-W MULLITE and DURO.

SOME OTHER H-W BASIC REFRACTORIES

The superior performance of Harbison-Walker basic refractories is the result of a thorough knowledge of the requirements, extensive and continuous original research conducted by the Harbison-Walker Research Department, and highest quality raw materials processed in modern plants under close laboratory control.

CHROMEX
—a chemically-bonded chrome-magnesite brick having excellent spalling resistance.

MAGNEX
—a chemically-bonded magnesite-chrome brick—highly basic and of low spalling tendency.

H-W CHROME
—a hard burned chrome brick especially adapted for various specific uses.

FORSTERITE
—the only commercially produced magnesium-silicate brick—suited for certain particular applications.

H-W PERIKLASE
—an exceptionally high magnesia brick of unusual high-temperature stability.

H-W INSULATING REFRACTORIES
—all classes of insulating brick, castables and block insulation from which to select those best suited for each precise requirement.

RAMMING MIXTURES, GRANULAR REFRACTORIES, CEMENTS AND CASTABLES

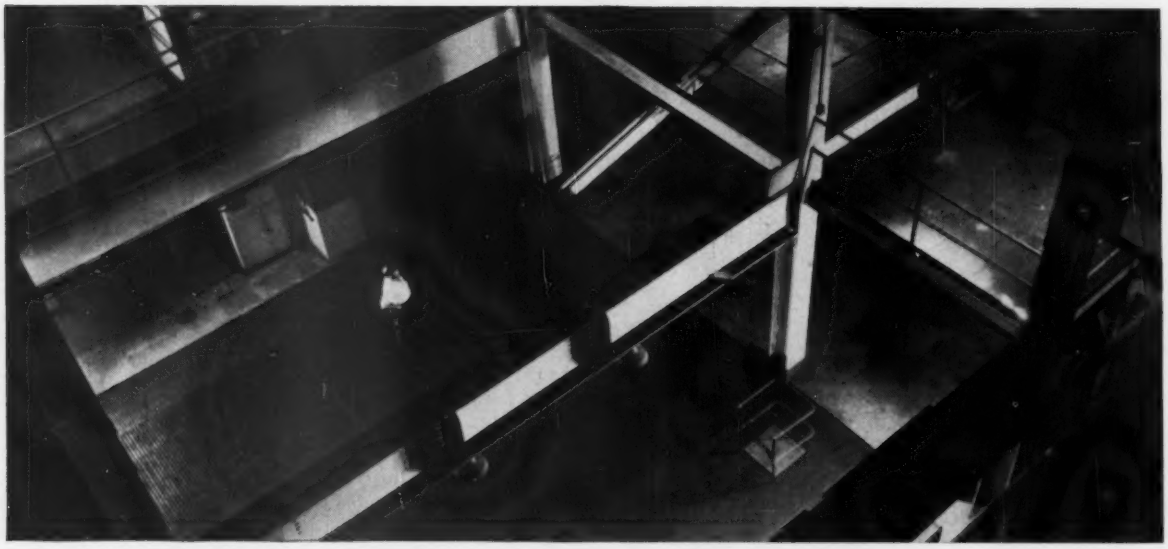
H-W MAGNAMIX . . . H-W C MIX . . . H-W WASHINGTON DEAD BURNED MAGNESITE GRAINS . . . H-W WASHINGTON FURNACE MAGNESITE . . . H-W SPECIAL FURNACE CHROME . . . DRY and PLASTIC THERMOLITH BATCH (Plastic Chrome Ore) . . . H-W PLASTIC FIRE BRICK . . . H-W Castable Refractories of all classes including those of basic composition, i.e. HARCHROME, CHROMEPAK and H-W PERIKLASE Castable.

The outstanding records made by Harbison-Walker refractories are due to the most modern and efficient manufacturing facilities, the full complement of types and classes, and the closely controlled high quality of the products.

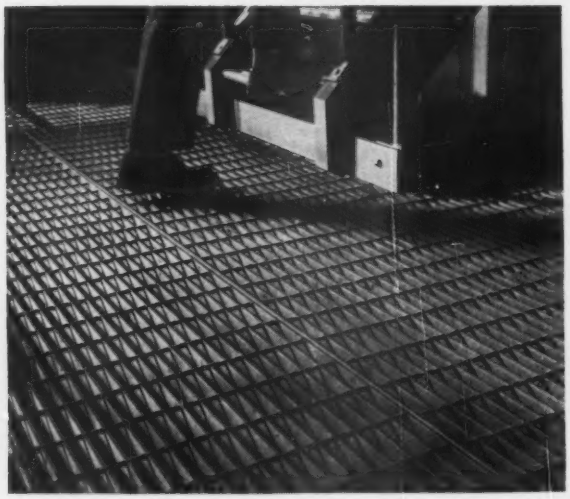
Harbison-Walker's technical staff stands ready to assist in the selection and application of refractories that will serve dependably and economically.

Harbison-Walker Refractories Company
AND SUBSIDIARIES
World's Most Complete Refractories Service
General Offices . . . Pittsburgh 22, Pennsylvania

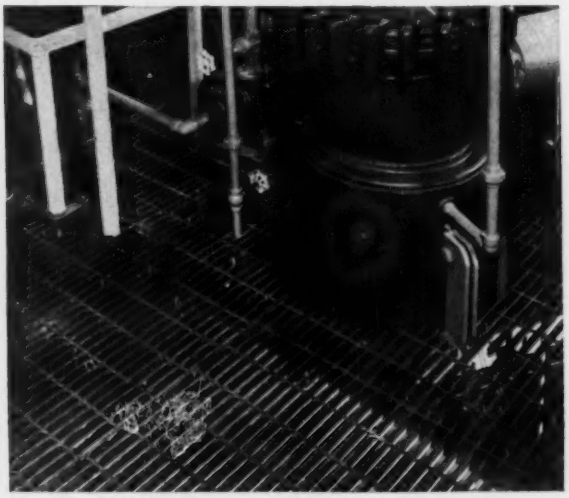
designed for flexibility...**Electroforged® for strength**
Blaw-Knox Grating fits modern plant needs



More floor space . . . Platforms, mezzanines and loading docks made of flexible Blaw-Knox Electroforged Steel Grating increase storage space, enlarge feeder areas. Easily installed, and easily adapted to changing layouts.



Safer walking . . . on *non-slip* floors, walkways and stairs, Blaw-Knox Electroforged Steel Grating provides rigid one-piece construction and features the twisted cross bar to make every step a safe step.



Fits anywhere . . . around pipes, beams and machinery to provide a neat, easy-to-maintain surface. There's nothing to wear, patch or catch dirt. And Blaw-Knox Grating admits more light and air for ideal working conditions.

Write for Bulletin 2527 and see how Blaw-Knox Grating can be custom fabricated to meet your plant improvement specifications.

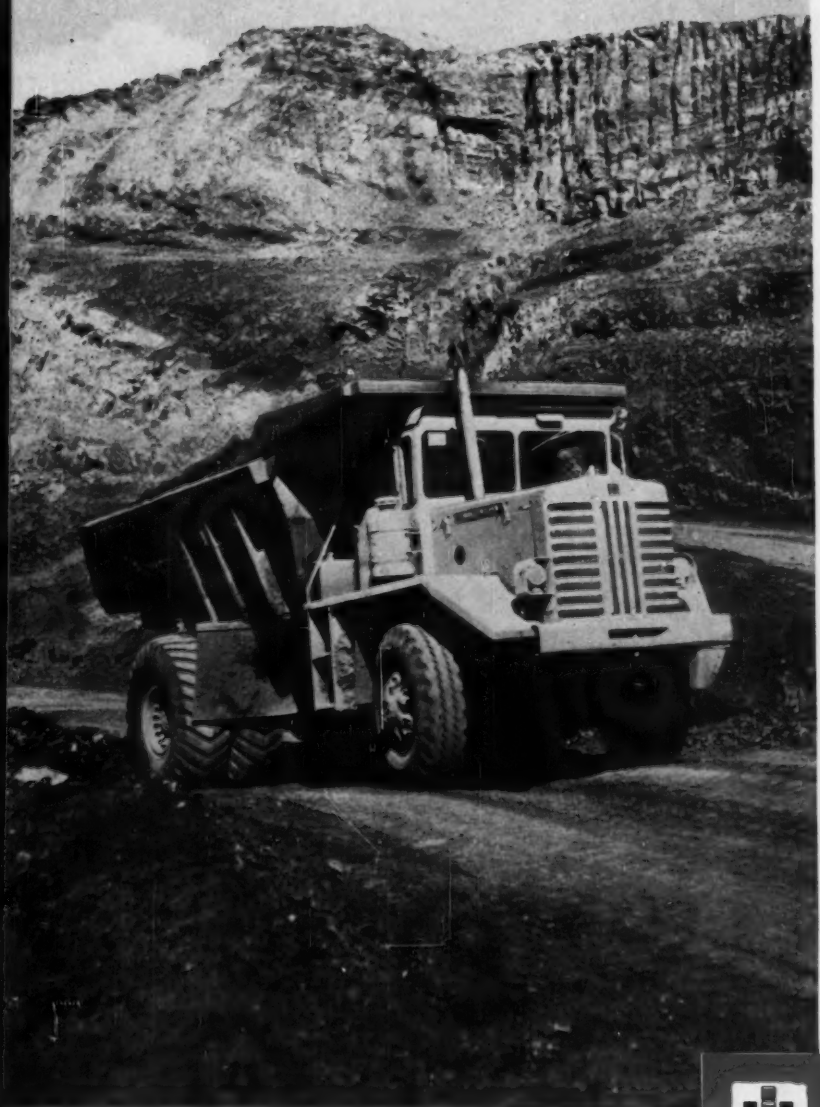
BLAW-KNOX

BLAW-KNOX COMPANY

Equipment Division
Department S, Pittsburgh 38, Pennsylvania

"95" Payhauler® beats trailer units by up to 50 seconds...

in 20% grade climb-outs!



Phosphate mine superintendent reports "95" gains up to 100 cu. yd. daily!

A bonus-powered International "95" Payhauler®, in carefully timed tests, climbed the winding 20% grade, up to 50 seconds faster than competitive crawler-pushed trailer units!

The Payhauler, and the two "articulated" hauling units, bring out 18 cu. yd. loads apiece at the Simplot Corporation's phosphate rock mining operation near Blackfoot, Idaho.

Supt. Robert Bulard reports: "The Payhauler gains approximately 100 cu. yd. daily over our other 18 cu. yd. haul units. Not only does it have greater speed, but the Torqmatic braking gives it greater safety as well. This morning, light rain made pit roads so slippery all equipment quit except the Payhauler. It never missed a load."

Power on Payhauler rear wheels delivers top operating efficiency on steep grades or under "slick" conditions where trailer units bog down completely. Prove the fast get-away surge, the extra climbing power, and up to 25% faster haul speed of an International Payhauler. That's the exclusive result of bonus turbo-charged diesel power; road-matched and load-matched gear choice; and the power-cushioning leverage of planetary drive axles!

Try Payhauler "pick-up truck" spotting ease. Exclusive high reverse speed, "zip-around" power steering, and grade-beating power get the credit! See how 12-second dumping with double-acting hydraulic hoist speeds the cycle. See your International Construction Equipment Distributor for a Payhauler demonstration.

International Harvester Co.
180 N. Michigan, Chicago 1, Ill.

Gentlemen:

☐ I am a contractor. ☐ Am an equipment operator (please check square that applies). Send me Payhauler Catalog (CR-603-G).

Name_____

Street Address_____

City_____ State_____

International®
Construction
Equipment

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

TD-24's cut shovel - ...beat other crawlers on

—for Century Mining Co., Inc. Matoaka, W.Va.

Problem To remove 50 feet of overburden of shot rock, slate, and sandstone material from a 45-inch coal seam, at lowest possible cost.

Objectives To "tie-in" big shovel and big crawler production. To avoid rehandling of overburden by the big shovel. To take advantage of the profitable "edge" each machine offers in its own operating field.

Profitable solution The giant shovel first moves overburden to full boom length and dumps it. Then the Planet Power-steered TD-24 dozes the material 100 feet to the spoil area.

The TD-24 saves 50% of a big shovel's time by removing shovel-dug overburden so the shovel can make the 45-foot-wide exposure cut without rehandling spoil. Century Mining Company, Inc., Matoaka, W. Va. has two big shovels, each teamed with a TD-24, using this method!

User comments By Century Operator Richard McComas: "TD-24 Planet Power steering keeps a full blade load in a turn, always delivering maximum yardage." By Century Superintendent James Creaturo: "We are averaging 3,500 hours on TD-24 track chains and rollers plus low over-all maintenance, in extremely adverse conditions. The TD-24 beats any other crawler we've used for long life."

Prove what it means to command exclusive TD-24 Planet Power steering with *full-time* "live" power on both tracks for big-yardage overburden dozing. Compare TD-24 tough-job durability to anything else on tracks! See your International Construction Equipment Distributor for a demonstration!

International® *Construction Equipment*

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

See International Payhauler, at Booths 240-340—

stripping time 50%
long track life, low upkeep

Giant TD-24 tractor, and International Drott 4-In-1 Skid Shovels
Mining Congress, San Francisco, September 22-25, 1958

Get cost-tumbling 4-machine utility in NEW mining TD-6 or TD-9 4-in-1

U. S. Bureau of Mines APPROVALS No. 2409, 2410

The components of these new International Drott underground mining tractors were safety-tested and approved at the Bureau of Mines Laboratory, Pittsburgh, Pa.

Yes, now you can have the exclusive 4-In-1 with four-machine utility in two International Drott mining tractors: the new TD-6 with one cu yd capacity, and the 1½ cu yd TD-9.

Both versatile, big capacity rigs meet rigid U. S. Bureau of Mines safety standards for non-coal mining. Both feature the new short-coupled, stainless steel scrubber—that cools exhaust to a maximum of 160°F, while efficiently dissolving irritating aldehydes with water-bath turbulence.

The new design also provides blower fan action on the final exhaust which breaks up noxious gas concentrations to a ratio of 40 parts fresh air to one part exhaust.

In addition, low "trolley-clearing" profile, and "lean-over" features of these compact rigs provide unmatched, full-load "mine-tunnel" maneuverability.

Prove the tremendous cost-cutting, profit-producing advantages of getting big-capacity four-machine utility for one moderate investment—instantly, at the touch of a hydraulic machine-selector lever! See your International Drott Distributor for a demonstration of the new TD-6—or 1½ cu yd TD-9—mining tractor!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL®
DROTT®

Ever wish you could pull a dozer "out of your hard-hat"...

to quickly shove material aside or pile it? Well, it's just that simple with an International Drott 4-In-1!

Ever wish you could have a clamshell by "a twist of the wrist"...

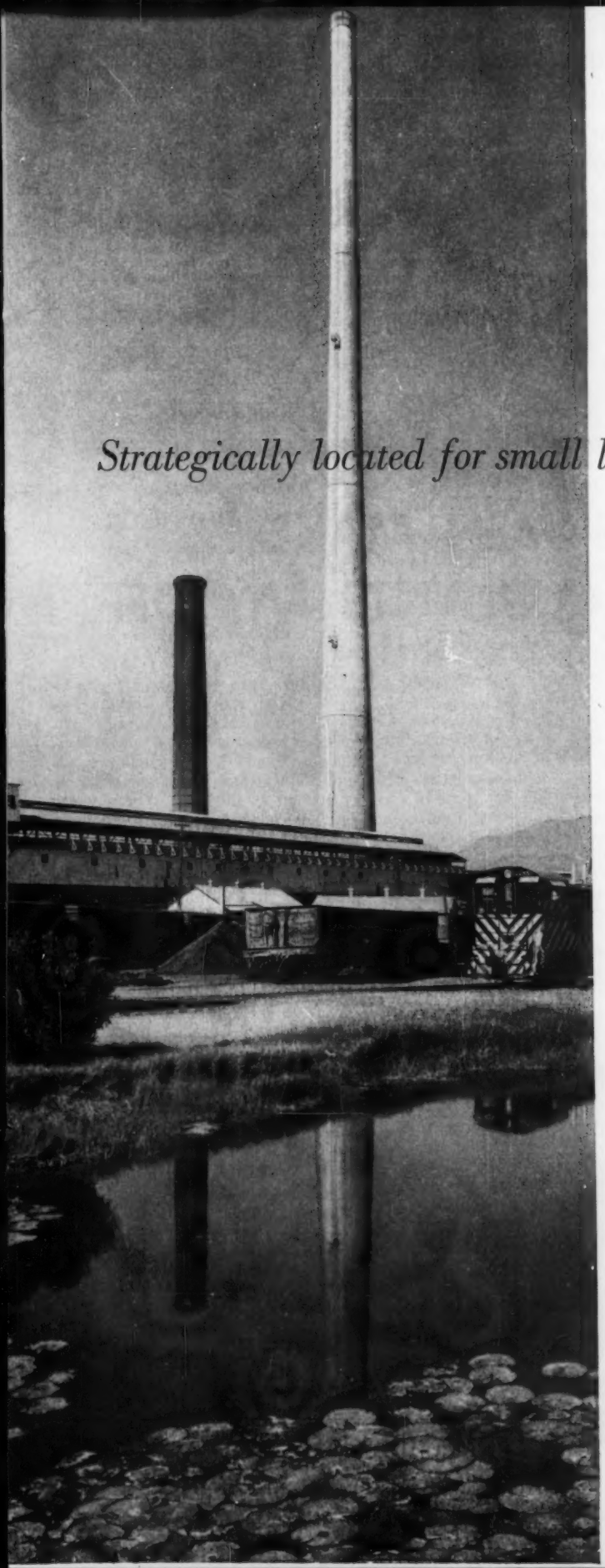
to have a bucket with "stand-and-fill" action to work under low ceilings and in close quarters? Well, it only takes a flip of the lever to start earning money with the 4-In-1's clamshell!

Ever wish you could take a "carry-type scraper" underground...

one that can strip, grade, or spread with inch-close accuracy—and can "skin-off" layered materials like nothing else on tracks? Well, you can! Famous 4-In-1 gives you this action, too!

Ever dream you could command "rock-busting" Skid-Shovel action...

from a mobile, sure-treading crawler loader—and get three other machine actions, to boot? Well, you can in a 4-In-1—for Skid-Shovel action, with exclusive pry-action break-out, is integral in 4-In-1 design!



See ASARCO first
buying, smelting, and
refining all types of ores:
GOLD, SILVER, LEAD,
COPPER AND ZINC ores
and concentrates, blister
copper, mattes and residues
22 Smelters and Refineries

Strategically located for small lots or carload quantities...

LEAD SMELTERS
Selby, California
Leadville, Colorado
Alton, Illinois
East Helena, Montana
El Paso, Texas
Chihuahua, Chih., Mexico
San Luis Potosi, S.L.P., Mexico

ZINC SMELTERS
Amarillo, Texas
Corpus Christi, Texas
Rosita, Coah., Mexico

COPPER SMELTERS
Hayden, Arizona
El Paso, Texas
Garfield, Utah
Tacoma, Washington
San Luis Potosi, S.L.P., Mexico

LEAD REFINERIES
Selby, California
Omaha, Nebraska
Perth Amboy, New Jersey
Monterey, N.L., Mexico

COPPER REFINERIES
Baltimore, Maryland
Perth Amboy, New Jersey
Tacoma, Washington

See management
at above locations
or write to main office.
American Smelting and
Refining Company,
Ore Purchasing Department,
120 Broadway,
New York 5, N. Y.

58-54

ASARCO

NEW CHEMICALS *play important mining role*

Recent economic shifts throw even more burden on mining processors. And more and more mining men are looking to chemicals to ease that burden. For several years modern mining chemicals from Dow have helped to improve ore processing and increase yield. How mining men use Dow chemicals and technical service to deflate operating costs and make recovery more efficient is highlighted below in condensed form for busy executive reading.

You may wish to check certain items in this advertisement and forward to those concerned in your company.

ROUTE TO:

_____

_____

_____

_____

MINING MEN MAKE SEPARAN FLOCCULANTS PAY OFF

Although it might be said that Separan NP10* was born with a mineral spoon in its mouth, it took a lot of cooperation on the part of mill operators to develop this new flocculating agent. In the past four years, Separan has gained widespread use in the industry. Prospects for the future include an entire family of Separan products for specialized recovery assignments.

*SEPARAN NP10 IS AN IMPROVED FORM OF SEPARAN 2610

In 1954, a new type of synthetic flocculant was christened Separan® in Dow laboratories and prepared for its debut to industry. Every characteristic of the new material pointed it toward a brilliant career in mining. Its settling rate with many different types of ore was unbelievably fast. Floc formations were almost ideal. Resultant filter cakes were thick and porous.

Will it work? The big question was, "Can Separan be made to function as well in the field as it does in laboratory tests?" The only way that question could be answered was by use under actual operating conditions in recovery equipment. Dow technical service men visited mills throughout the mining world.

At first, there were many problems to be solved. How much Separan was most efficient for a specific ore and a specific operation? What percentage solution should be used? How much time should elapse from one addition of Separan to the next? Where, when and how should Separan be introduced into the leached ore?

Pieces fit puzzle. The answers came slowly at first, but mining men were interested in the unique abilities of this new flocculant. Their diligent cooperation with Dow specialists soon paid off. In early 1955 the pieces of the puzzle began to fit together and Dow was able to intelligently advise other mill operators about the use of Separan.

Ore	Before Tons/ Day	After Tons/ Day	
Very slimy	50	400	at 1.0# Separan NP10/T
Blended	200	450	at 0.6# Separan NP10/T
Blended	250	500	at 0.5# Separan NP10/T
Good limestone	350	500	at 0.15# Separan NP10/T

Increased filtering rate resulting from use of Separan NP10.

Separan increases recovery capacity without adding equipment.

One of the most spectacular areas for Separan proved to be in the recovery of uranium. Today, this useful flocculant is in widespread use in the uranium mining industry. Dow technical servicemen (who average sixteen years of mining experience per man) are still working side by side with processors.

New family of flocculants. Meanwhile, in Dow laboratories, other specialists were developing Separan NP20, the newest addition to the Separan family of flocculants. Like Separan NP10, Separan NP20 is a new high-molecular weight polyacrylamid material. It has the highest flocculating activity of any commercially available flocculant. This is a part of a continuing Dow program to provide new and useful chemical "tools" for the entire mining industry.

DOWFROTH:
lively, long-lived frother

One of the best frothers yet devised for use in the flotation process is Dowfroth® 250. With as little as 25% of the quantity it takes with other frothers, it sustains a lively controllable frothing action. Dowfroth won't harm rubber parts in flotation machines and its froth can be readily laundered, pumped and thickened.

Easy to see why profit-minded mining management men are enthusiastic about Dowfroth. Says one, "A Dow field man urged us to try Dowfroth 250 for a particularly tough frothing problem. It did an excellent job and now we use it in all our flotation units."

★ ★ ★ ★

For information on any of the chemicals discussed in this advertisement write THE DOW CHEMICAL COMPANY, Chemicals Sales Department 764J-1, Midland, Michigan.

XANTHATES:
nine little Indian boys

Metallurgical engineers can choose from nine highly selective Xanthates.

Like the early American Indian, Dow Xanthates are so inconspicuous in their natural environment – in this case, flotation processing – that you have to look hard to find them. These nine highly selective collectors come in water-soluble pellet form, easy to handle and apply. No dust, no waste. They're essentially nonfrothing. This makes for better control all the way around. Even though you can't see them, a glance at the metallurgical results tells you Xanthates are there all right, silently, unobtrusively and efficiently doing their job.

Flotation Fundamentals is the name of a Dow handbook that's been on the mining "best seller" list for several years. Brand-new revised edition now available makes helpful reading for anyone concerned with mineral recovery. Contains hundreds of facts and figures, tables and metallurgical data.

DOW CHEMICALS BASIC TO THE MINING INDUSTRY

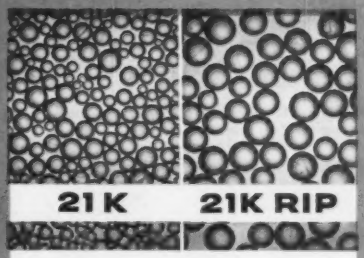
Flocculants · Ion Exchange Resins
Preservatives · Chelating Agents
Ammonia · Solvent Extractants · HCL
Frothers · Chlorine · Calcium Chloride
Alkalies · Flotation Agents

YOU CAN DEPEND ON

DOW

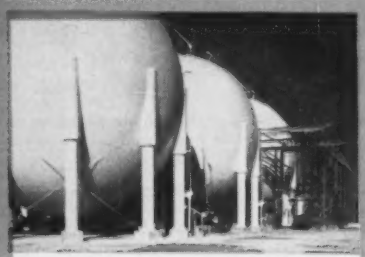
On the mining chemical NEWSFRONT

SOLVENT EXTRACTANTS. Dowsol* 12, brand-new organic phosphate extractant for solutions, pulps and slurries of uranium. A monododecylphosphoric acid (DDPA) as a 25-30% solution in kerosene . . . transfers metal values from solution to solvent. *TRADEMARK

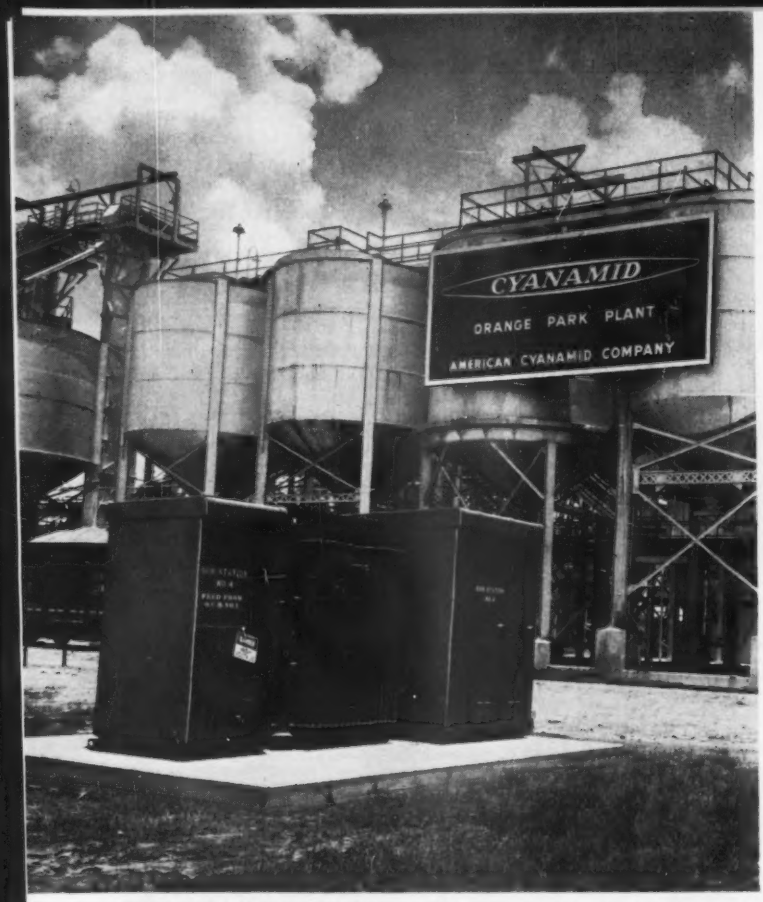


ION EXCHANGE RESINS. Two new entries in the field, Dowex® 21K and Dowex 21K RIP, lend new effectiveness and economy to such tasks as removing and concentrating uranium from acid solution. Complete line of resins and expert technical service immediately available.

Z®-200. Something new in flotation reagents . . . a tailor-made unique, collecting agent for copper minerals and copper-activated zinc minerals where rejection of pyrite is of critical importance. Superior to any other collector in this application.



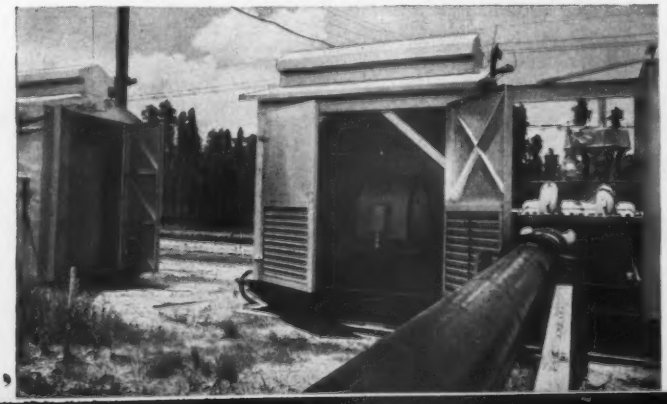
AMMONIA. New trend: Dow Ammonia used three new ways. Extracts nickel from low grade non-sulfide ores. Precipitates uranium from pregnant solution. Pressure leaches copper-nickel flotation concentrates to recover the two metals separately in powder form.



EFFICIENT, DEPENDABLE G-E 750-kva load-center unit substation provides recovery plant power for flotation and concentration equipment.

PRECISE CONTROL and dependable d-c power enable this Bucyrus-Erie dragline to handle 1100 yards of rock/hour. G-E equipment improves efficiency, cuts costs.

RUGGED G-E TRI/CLAD* 700-hp wound rotor motor drives this centrifugal pump to move slurry from mine to recovery plant. G-E Limitamp* control is shown at left.
* Registered Trade-mark of General Electric Co.



American Cyanamid specified General Electric to help . . .

PROTECT AGAINST DOWNTIME

Dependable electrical system aids continuous processing of phosphate rock

At American Cyanamid Company's new Orange Park washer and flotation plant near Lakeland, Florida, downtime in their continuous washing and recovery process for phosphate rock can cost hundreds of dollars per day. To keep downtime losses at a minimum, General Electric system-engineered electrical equipment is used.

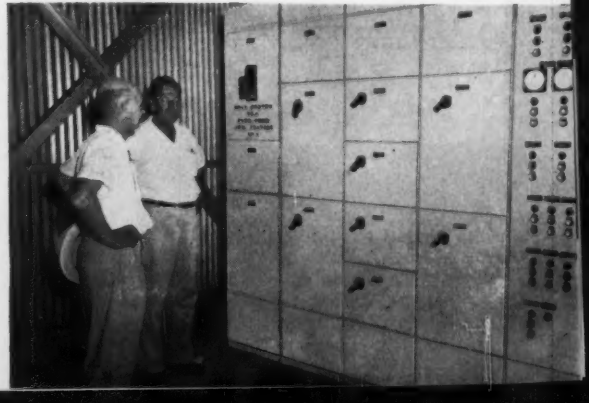
G-E MOTORS, CONTROL and power distribution equipment help maintain a smooth flow of materials from mine through final recovery of phosphate. Installation of electrical apparatus on a system-engineered basis helped this plant get into operation faster and perform more efficiently.

WHEN EXPANDING OR MODERNIZING your operations which require above all, *dependability*, ask your nearest General Electric Apparatus Sales Office about G-E system-engineered electrical products. General Electric Company, Schenectady 5, New York. 660-35

Engineered Electrical Systems for the Mining Industry

GENERAL ELECTRIC

ECONOMICAL General Electric motor control center undergoes inspection by American Cyanamid Supt. F. Boyd, (r), and G-E Sales Engineer G. W. Halstead.



DRASTICALLY REDUCES *DOWN-TIME* LOSSES!

THE GENERAL TRUCK TIRE

The all-new WIDE BASE

GENERAL

with NYGEN®

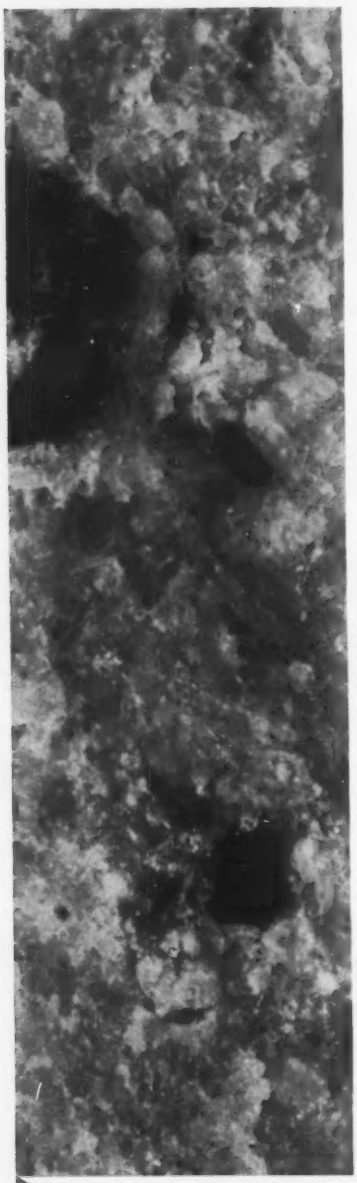
LOGGING
CONSTRUCTION
MINING

You'll find less time chalked up to down-time once you've equipped your units with the new wide-base General LCM. Built sturdier and huskier with exclusive Nygen Cord and designed to give you consistent crawler-like traction and flotation, The General LCM rolls over the toughest job hazards to get every job done faster for more profit. See for yourself the biggest money-saver in the off-the-road field today... the all new wide-base General LCM.

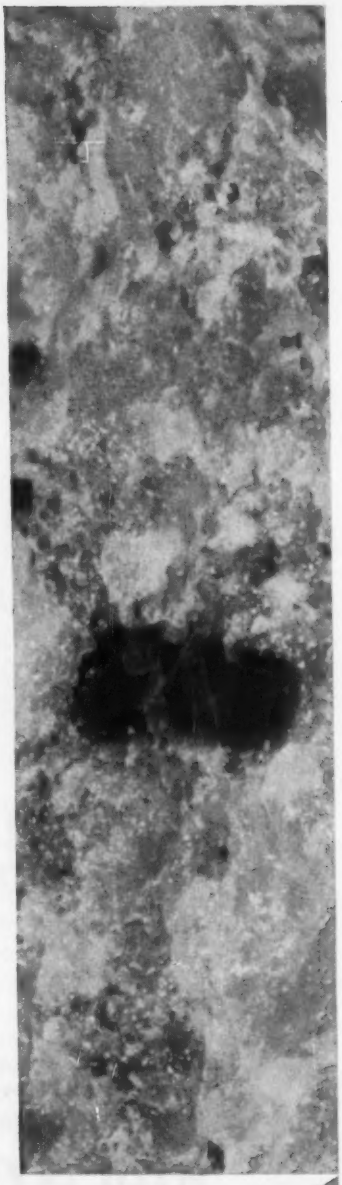
- built with exclusive NYGEN cord for matchless strength
- designed to provide crawler-like flotation and traction
- minimum rolling resistance in all kinds of going
- precision engineered to reduce operating costs

Specify GENERALS *on your new equipment*

THE GENERAL TIRE & RUBBER COMPANY • AKRON, O.



79,316 extra tons of gold ore ground with one set of Ni-Hard liners



Ni-Hard* nickel-chromium liner segments in a 7′ x 6′ overflow ball mill ground 195,765 tons of gold ore—79,316 tons more than manganese steel liners used in the same service.**

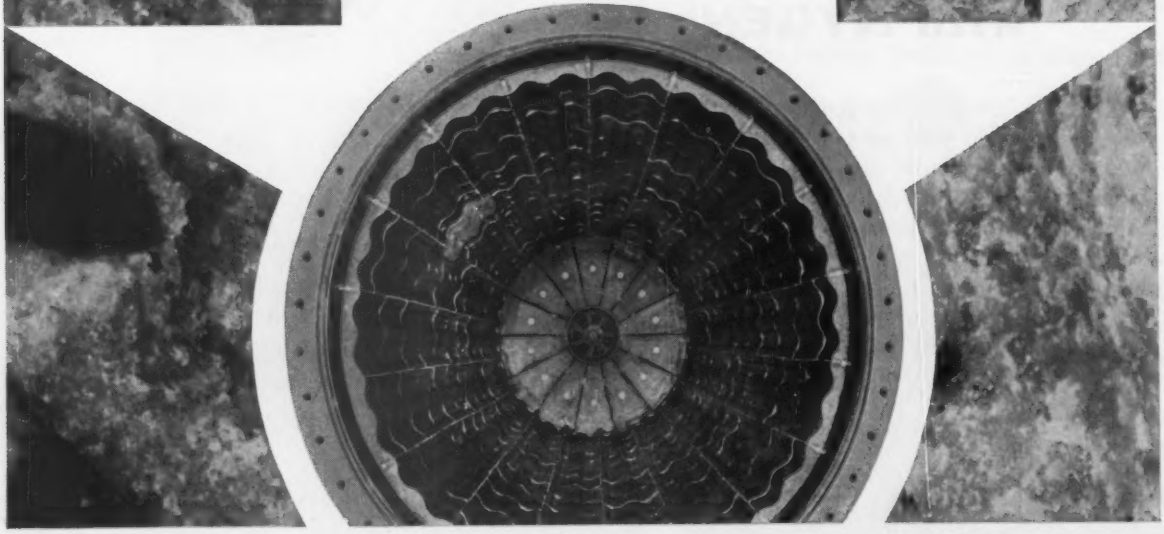
This extra tonnage reduced grinding cost per ton 45.5%!

Ni-Hard mill liner segments are available from authorized producers throughout the country. For the address of the one nearest you, write to Inco.

* Registered trademark ** Plant name and details on request

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

NI-HARD
Nickel Makes Alloys Perform Better Longer



CYANAMID

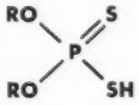
REAGENT NEWS

"ore-dressing ideas you can use"

AEROFLOAT® Promoters May Help You If Low Metal Prices are Pinching-- Concentrate Grade or Recovery is Troubling You

An experienced Cyanamid field engineer will be glad to work with you in your mill to help you improve metallurgy and get lower cost-plus-tails with a Cyanamid reagent combination, utilizing the AEROFLOAT Promoters. These collectors are usually much more selective in their collecting action on sulfide and precious metal ores than are the xanthates.

Liquid AEROFLOAT Promoters are essentially water-insoluble organic liquids based on the dithiophosphoric acid structure



where R is a phenolic ring. They exhibit some frothing properties.

Dry AEROFLOAT Promoters are water-soluble solids which are essentially non-frothing. They are sodium salts of alkyl dithiophosphoric acids.

where R is hydrocarbon chain.

The AEROFLOAT Promoters are often very effective when used together with xanthates or the 400 Series AERO® Promoters. AEROFLOAT Promoters are also noted for their selectivity toward copper, lead and zinc sulfide which they will generally float away from pyrite in neutral or low alkaline circuits.

In these times of low metal prices it will pay you to check the AEROFLOAT Promoters. Contact our nearest office or representative for further information.

AMERICAN CYANAMID COMPANY

EXPLOSIVES AND MINING CHEMICALS DEPARTMENT

CYANAMID INTERNATIONAL — *Mining Chemicals Department*
Cable Address: Cyanamid, New York

30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

CYANAMID OF CANADA LIMITED
160 Bloor Street East, Toronto 1, Ontario, Canada

CYANAMID DE MEXICO, S.A.
Apartado Postal 282 Mexico 1, D.F., Mexico

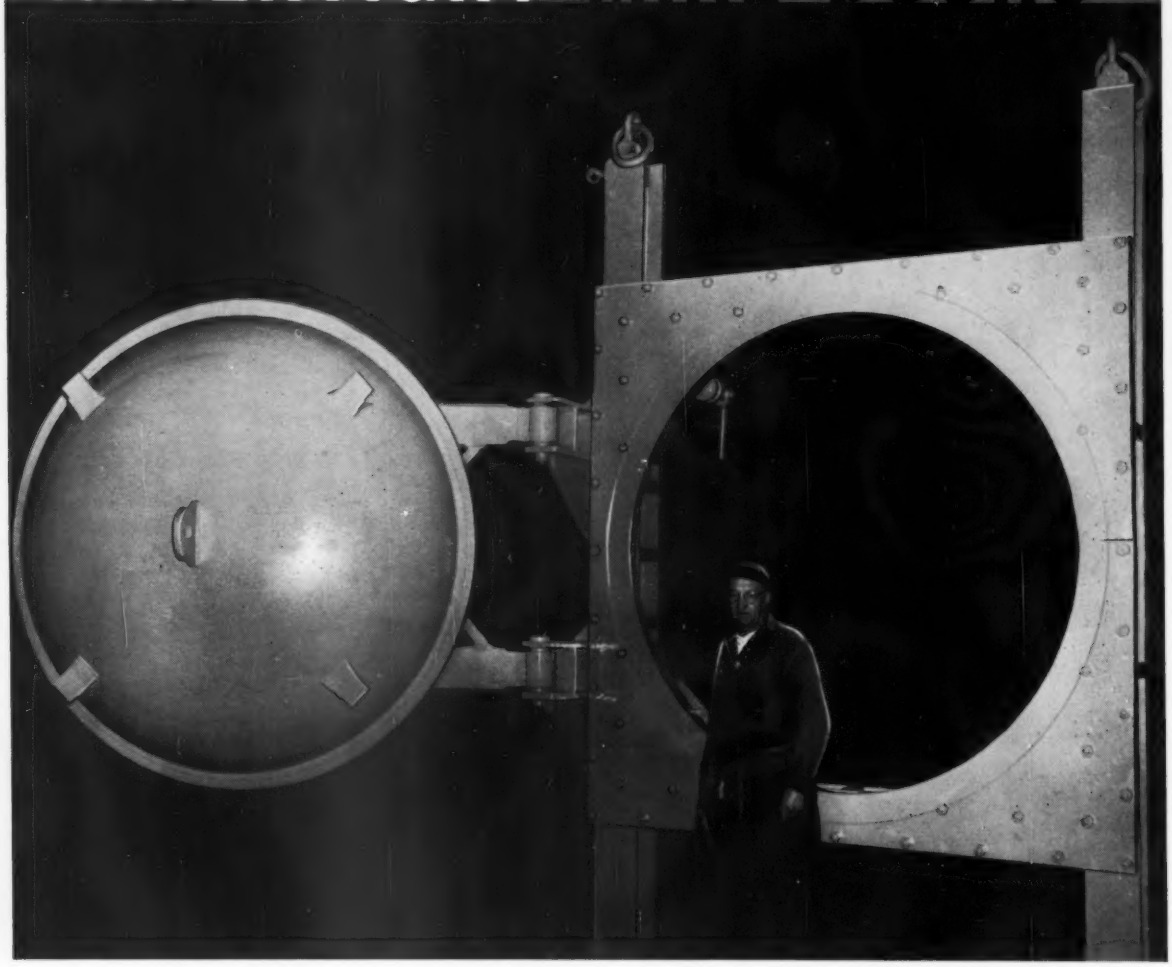
CYANAMID OF GREAT BRITAIN LTD.
Bush House, Aldwych, London W. C. 2, England

SOUTH AFRICAN CYANAMID (PTY.) LTD.
P. O. Box 7552, Johannesburg, Union of South Africa

E. P. CADWELL
Casilla 4292, Belen 1045, Of. 7, Lima, Peru

CYANAMID AUSTRALIA PTY. LTD.
"Collins Gate" 277 Little Collins Street Melbourne, Australia

WATERTIGHT MINE DOORS*



Modern construction—superior to any previous mine closure. Simple one-man operation. No bolts or special tools. Closes and seals against water pressure. No space problem when open. Economical to install. Doors now installed in New Jersey Zinc Company mines for 78 to 108″ openings and for pressure to 770# per square inch. Other sizes now on order.

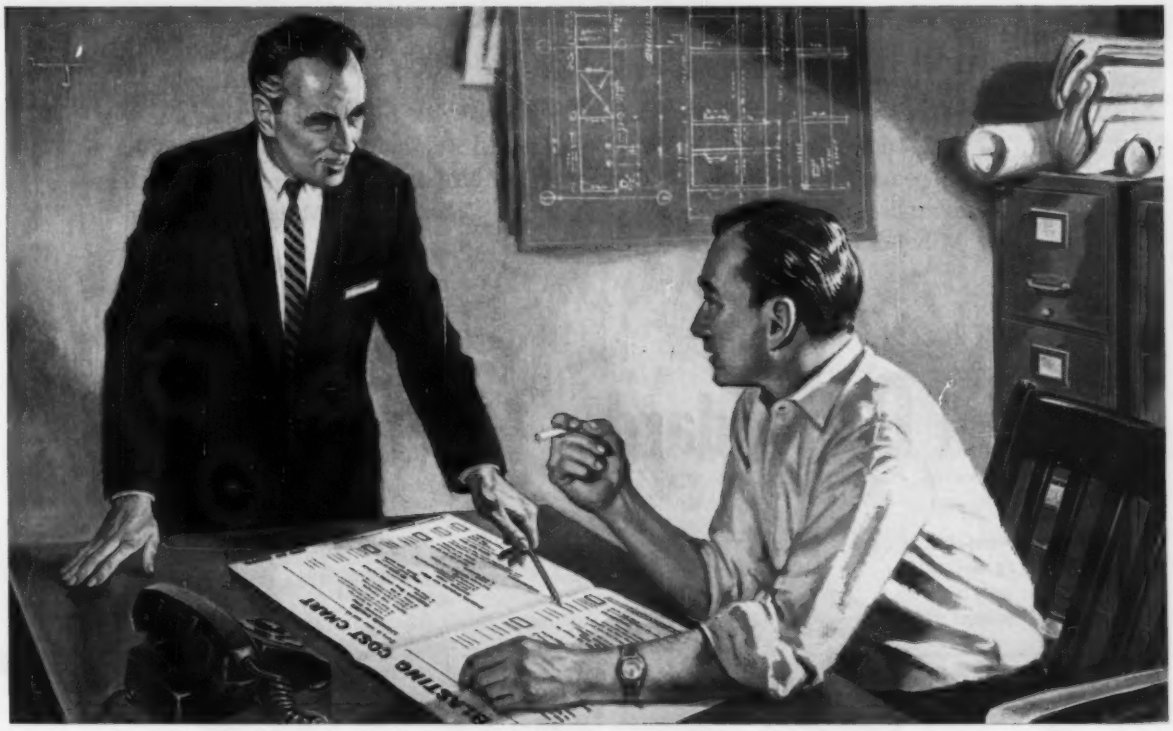
Inquiries directed to our Sales Engineering Department will receive prompt attention.

*"Patent Pending"

SUN SHIP

BUILDING & DRYDOCK CO.
CHESTER, PENNSYLVANIA

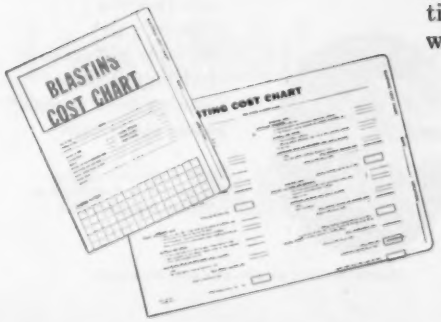
WHAT ARE YOUR TRUE BLASTING COSTS?



Get a complete profit picture with new, free Blasting Cost Chart! Let the Atlas Man show you how

Explosives costs alone don't always determine value of a blast. The explosives used have a direct effect on drilling, digging, hauling and crushing costs. Now, a free, simplified computing method—developed by Atlas, gives you a true, complete cost analysis of profits, without involved bookkeeping.

The Atlas Blasting Cost Chart enables you to protect or improve your profits. What's more, it's yours without cost and you can keep your figures confidential. The Atlas representative nearest you will be glad to show you how it works—without obligation.



EXPLOSIVES DIVISION
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE *offices in principal cities*

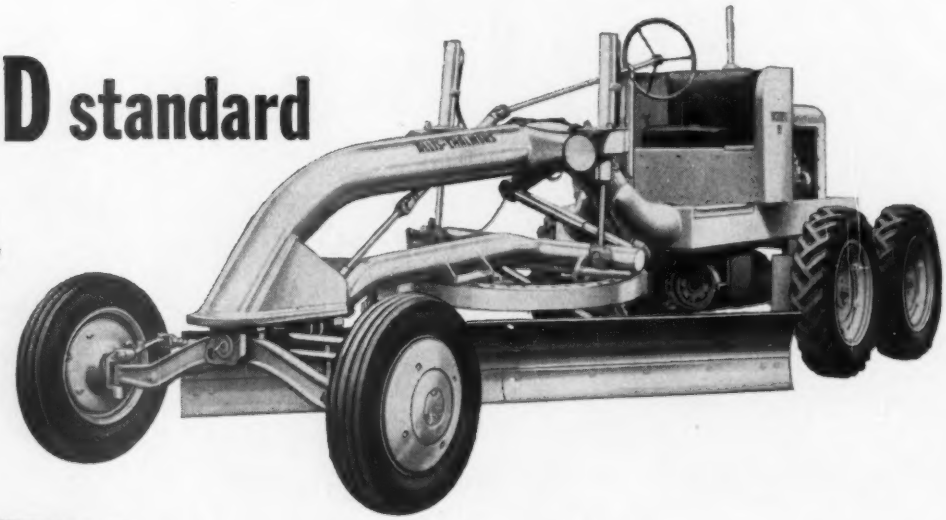
...for big economy on maintenance

GET THE ALLIS-CHALMERS

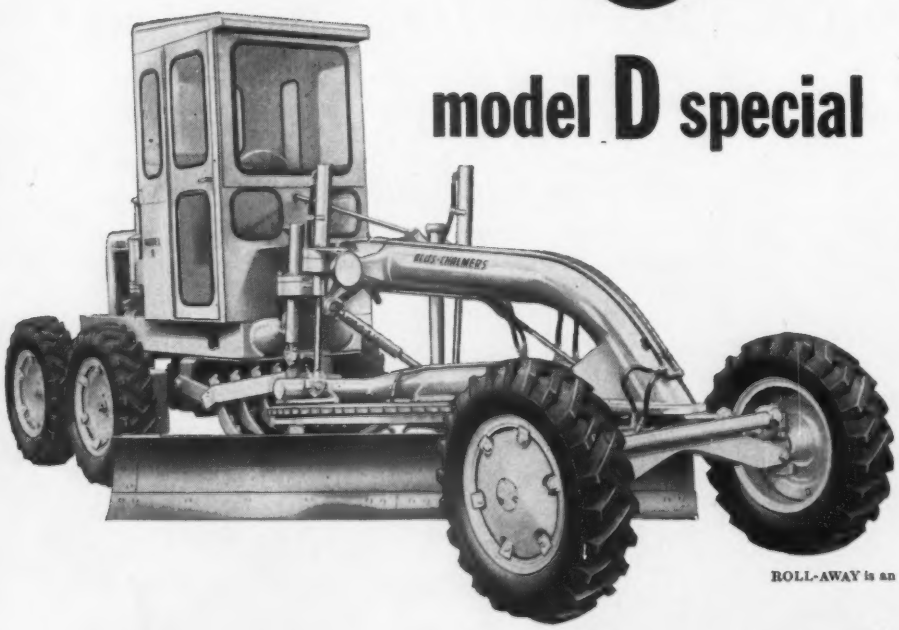
Here's the original low-cost motor grader with big-grader design and performance advantages. The Model D handles so many jobs so well, you have to see it at work to convince yourself. Your Allis-Chalmers dealer can arrange a demonstration. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

model D standard

50 hp
Approx. weight
8,800 lb (gasoline)
Approx. weight
9,350 lb (diesel)



model D special



50 hp
Approx. weight
10,900 lb (gasoline)
Approx. weight
11,450 lb (diesel)
4 forward speeds to 25 mph (approx.)
1 reverse speed to 3 mph (approx.)
All-steel cab*
Shiftable moldboard*
Hydraulic scarifier*
Leaning front wheels*
Power circle turn*

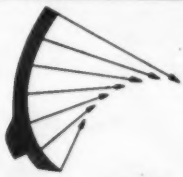
*Also available with the model D standard as optional equipment.

ROLL-AWAY is an Allis-Chalmers trademark.

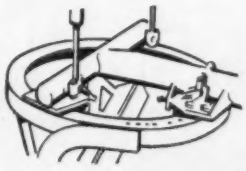
and construction work

MODEL D MOTOR GRADER

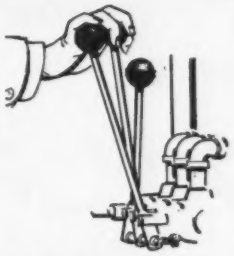
many production-boosting advantages



The ROLL-AWAY moldboard rolls dirt up and ahead to eliminate packing, reducing friction . . . gives you more performance per horsepower, more production per gallon of fuel.



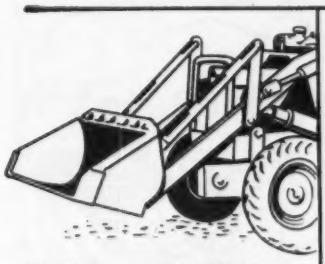
Revolving circle and heavy tubular drawbar provide exceptionally stable moldboard mounting.



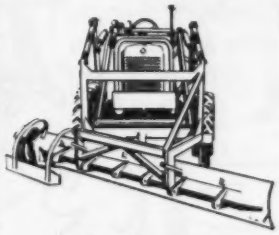
Convenient hydraulic controls, easy to operate. Two levers fit into one hand to control circle lift.

Positive tandem drive gives you four driving wheels under the heavy end of the grader.

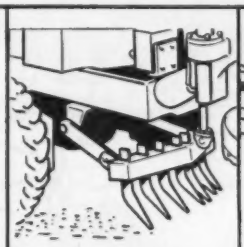
many job-multiplying attachments



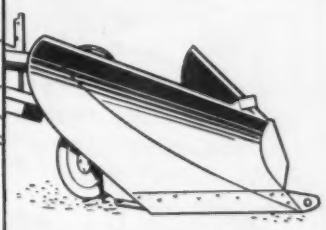
⅝-yd rear-mounted loader



Interchangeable shoulder maintainer



Midship-mounted scarifier



Blade and V-type snowplows

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Look ahead... *move ahead*...and stay ahead

with ALLIS-CHALMERS

BE OUR GUEST
use CF&I's hospitality center during the AMC show
CF&I
REST & SERVICE CENTER
THERE MUST BE A WATER TAP SOMEWHERE AROUND
THIS BEATS STANDING IN LINE FOR A 'PHONE!
YEAH MAN, AND NEXT I'M GONNA DICTATE A LETTER!
THIS SURE FEELS GOOD TO MY FEET
CF&I HAS A WATER COOLER AT ITS HOSPITALITY CENTER
YOU HANDLE DICTATION, TYPING AND POSTAGE FREE?
YES, SIR! IT'S PART OF CF&I CONVENTION SERVICE
THEY CERTAINLY MAKE THESE BOOTHS INTERESTING THESE DAYS!
MINE DON'T CARE IF I NEVER GET UP!
RIGHT! THESE CF&I DISPLAYS ARE WORTH SEEING!
I COULD SURE USE A FEW MINUTES REST RIGHT NOW!
GOOD! I'LL USE CF&I'S TELEPHONE SERVICE, WHILE YOU'RE AT IT
1958 MINING SHOW • SAN FRANCISCO
SEPT. 22-25
CF&I's BOOTH is 1640
We'll see you there!
THE COLORADO FUEL AND IRON CORPORATION
DENVER • OAKLAND • NEW YORK
6277

Mechanization returns greater dividends with Edison R-4 Cap Lamps on the job

Edison R-4 Electric Cap Lamps can help modern mining machines realize their *full* potential.

Reason why? Because more and better light is always on the job with the brilliant, unfailing beam of the Edison R-4. This dependable source of illumination permits the miner to perform his duties with utmost efficiency and safety. You don't have long to wait for results with the Edison R-4, either. They register quickly in terms of accident prevention and increased tonnage per man-shift.

Let us demonstrate the advantages of this *quality* cap lamp in your underground operation. Write or call us soon for more detailed information.

MSA
SAFETY EQUIPMENT HEADQUARTERS

MINE SAFETY APPLIANCES COMPANY
201 North Braddock Avenue, Pittsburgh 8, Pa.
At Your Service: 76 Branch Offices in the United States

MINE SAFETY APPLIANCES CO. OF CANADA, LIMITED
Toronto, Montreal, Calgary, Edmonton, Winnipeg, Vancouver, Sydney, N.S.
Representatives in Principal Cities in Mexico, Central and South America
Cable Address: "MINSAF" Pittsburgh

On the roughest SEALTITE electrical

against oil, grease, water, dirt, chemicals, corrosive fumes, salt spray, weather.

SEALTITE is a flexible *and* liquid-tight electrical conduit. It gives maximum protection to your wiring when it must connect moving parts, absorb vibration, follow machine contours, flex into U-bends, be easily maintained or be safeguarded between misaligned outlets.

It is being used successfully in wet locations, in tunnels, power plants, steel mills, canneries, chemical industries and in many outdoor applications. Sealtite comes in three types:

TYPE U.A.— TYPE C.S.A. Specifications for Type U. A. (Underwriters' Laboratories Approved) and Type C. S. A. (Canadian Standards Association Approved). Construction: flexible galvanized steel core, positive ground and tough extruded outer cover.

TRADE SIZE	INSIDE DIAMETER		OUTSIDE DIAMETER		APPR. INSIDE BEND DIAM.	EST. WGT. (Lbs. Per 100 Feet)
(Ins.)	Min.	Max.	Min.	Max.		
⅜	.484	.504	.690	.710	6	30.0
½	.622	.642	.820	.840	7	36.6
¾	.820	.840	1.030	1.050	10	48.2
1	1.041	1.066	1.290	1.315	12	87.7
1¼	1.380	1.410	1.630	1.660	15	116.5

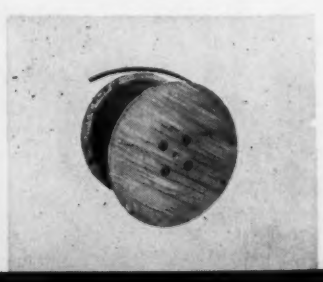
TYPE E. F.† (Extra Flexible)—for machine tools and industrial equipment. (Meets standards set by J.I.C.)

TRADE SIZE	INSIDE DIAMETER		OUTSIDE DIAMETER		APPR. INSIDE BEND DIAM.	EST. WGT. (Lbs. Per 100 Feet)
(Ins.)	Min.	Max.	Min.	Max.		
⅜	.485	.500	.695	.710	5	24
½	.620	.635	.825	.840	5	29
¾	.815	.830	1.035	1.050	6	39
1	1.030	1.050	1.295	1.315	8	67
1¼	1.370	1.390	1.635	1.660	10	87
1½	1.575	1.595	1.875	1.900	12	105
2	2.020	2.040	2.350	2.375	15	135
2½	2.480	2.505	2.850	2.875	20	198
3	3.070	3.100	3.470	3.500	26	282
4	4.000	4.040	4.460	4.500	34	414

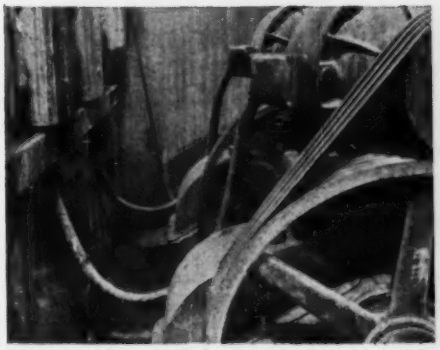
Commercial tolerances apply on above figures.

ELECTRICAL WHOLESALERS stock Sealtite. Buy it in long, random lengths on nonreturnable wooden reels, at no extra cost. Available in sturdy cartons that are easier to store and carry to the job. Liquid-tight connectors also are available from wholesalers' stocks. For information write: The American Brass Company, American Metal Hose Division, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

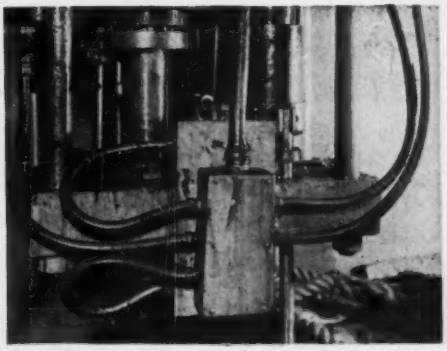
†Pat. applied for 3 .82 Rev.



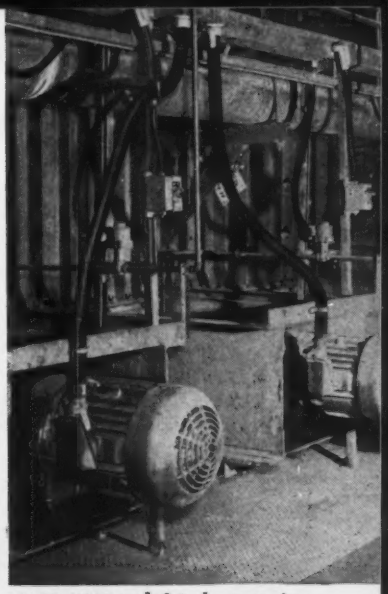
jobs in your plant conduit protects wiring



ABRASIVE GRIT around these sand pumps in a rod and ball mill pit can't faze Sealtite.



OIL, GREASE, WATER constantly cover these Sealtite control connections. Still no trouble.

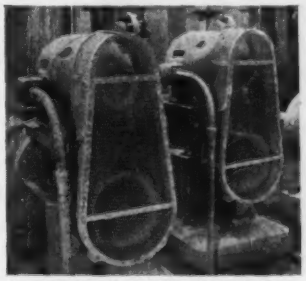


BOILER HEAT and 6-inch expansion rise are easy service for Sealtite.

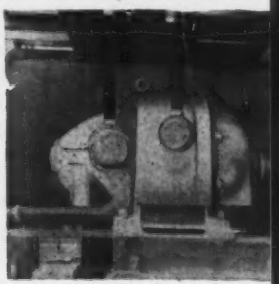
CHEMICALS. Sealtite shrugs off hot chlorine vapors in this plant—another example of its ability to resist chemicals and corrosive fumes.

WEATHER. Install Sealtite outdoors. It stands up under tropical sun and heat, rain, ice, and arctic cold. Protection is complete.

ON MOBILE EQUIPMENT Sealtite can take up movement, withstands weather, dust, vibration. It's fast and easy to install.



MOVEMENT AND VIBRATION that would crack rigid conduit are absorbed by Sealtite on connections for these tailings pumps.



ABRASIVE DIRT AND VIBRATION at this ball mill motor are tough enemies—but Sealtite can take it.

CUTAWAY SECTION of Type .U.A. Sealtite shows tough polyvinyl jacket over flexible metal core. Copper conductor wound spirally inside conduit gives positive ground.

Insist on the conduit marked **SEALTITE®**

FLEXIBLE, LIQUID-TIGHT CONDUIT

an **ANACONDA®** *product*

Euclid Rear-Dumps give you bonus benefits

For 25 years Euclid has specialized in designing and building equipment for heavy, off-highway earthmoving. The dependable low cost performance of these "Eucs" has made them the standard of comparison for contractors, mines and quarries around the world. About 7 of every 10 off-highway Rear-Dumps are Euclids.

Although this unmatched experience may not be apparent when comparing specifications, it assures bonus benefits for Euclid owners—cost-cutting advantages not provided by comparable equipment. The greater use of Euclids results in faster complete field exposure to operating and maintenance characteristics under all conditions. It assures advanced design that pays off in more work-ability and minimum downtime on the job.

With Euclid's larger machine population, it's economically possible for Euclid dealers to provide more complete service facilities and ready availability of all factory engineered replacement parts. It's factors like these that enable owners to keep their "Eucs" operating at peak efficiency with unusually high availability and low production cost.

When you're considering Rear-Dumps, get facts and figures from your Euclid dealer—have him show you why ***Euclids are your best investment.***

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Your Euclid Dealer offers the best equipment investment

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

PIT MINE OR QUARRY... CYANAMID EXPLOSIVES GET RIGHT DOWN TO PAY-DIRT!

In overburden, ore body or rock, blasting efficiency is achieved only when every shot is carefully studied and properly designed ...using a high-quality explosive that is exactly suited to do the job. Cyanamid's complete line of explosives and our experienced staff offer you every technical service... plus speedy delivery right to your operation. For more information, just call your Cyanamid Representative, or write to AMERICAN CYANAMID COMPANY, EXPLOSIVES AND MINING CHEMICALS DEPARTMENT, 30 Rockefeller Plaza, New York 20, New York.

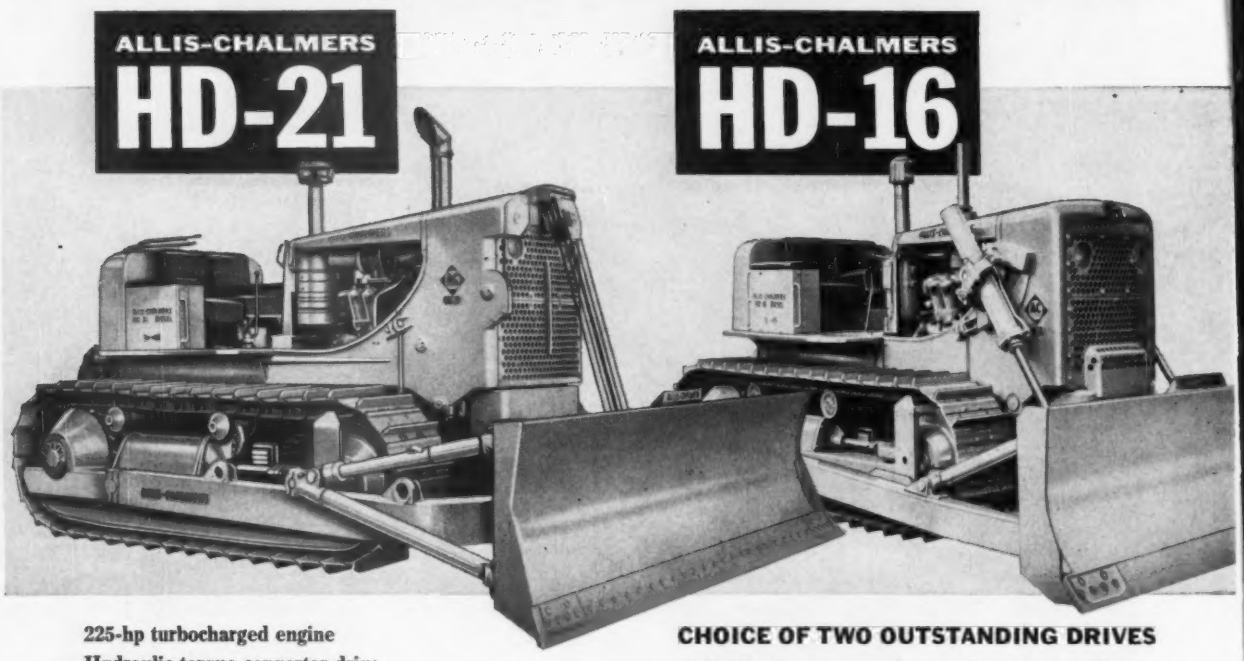
This effective shot was made with Cyanamid explosives in hard limestone at a typical quarry. Fragmentation is perfect for loading, hauling and crushing.

CYANAMID

DISTRICT SALES OFFICES: St. Louis, Missouri • New York City, New York • Latrobe, Pennsylvania • Pottsville, Pennsylvania • Scranton, Pennsylvania Dallas, Texas • Salt Lake City, Utah • Bluefield, West Virginia. **THE CYANAMID LINE:** High Explosives • Permissibles • Seismograph Explosives Blasting Agents • Blasting Powder • Blasting Caps • Electric Blasting Caps • Blasting Accessories.

ALLIS-CHALMERS CRAWLER TRACTORS . . .

first choice on more and



225-hp turbocharged engine
Hydraulic torque converter drive
56,260 lb (approx. as shown)

The new HD-21 brings you live power for today's big-tractor jobs—and torque converter drive puts it to work automatically. The HD-21 offers more work capacity—dollar for dollar—than any other big crawler tractor you can buy.
HD-21A illustrated—Two other models available

CHOICE OF TWO OUTSTANDING DRIVES

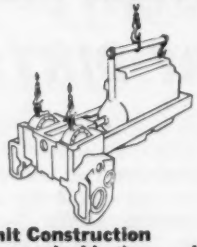
Hydraulic torque converter	All-gear drive
150 net engine hp	141 belt hp
39,090 lb (approx. as shown)	125 drawbar hp

Get up on the HD-16 yourself—and see how it handles jobs ordinarily assigned only to bigger, more expensive crawler tractors. You'll sell yourself—just as more keen-eyed construction men do every day.
HD-16DC illustrated—Five other models available

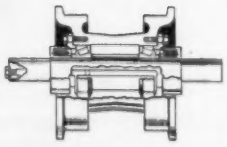
THE ONLY COMPLETE LINE OF CRAWLER TRACTORS

Pioneered and proved by Allis-Chalmers Engineering in Action

Torque Converter Drive gets more work done—automatically provides the right pull or push for every load, at maximum speed for existing conditions. *(Available in HD-21 and HD-16 only.)*



Unit Construction saves valuable time . . . lets you remove any major assembly without disturbing adjacent assemblies.



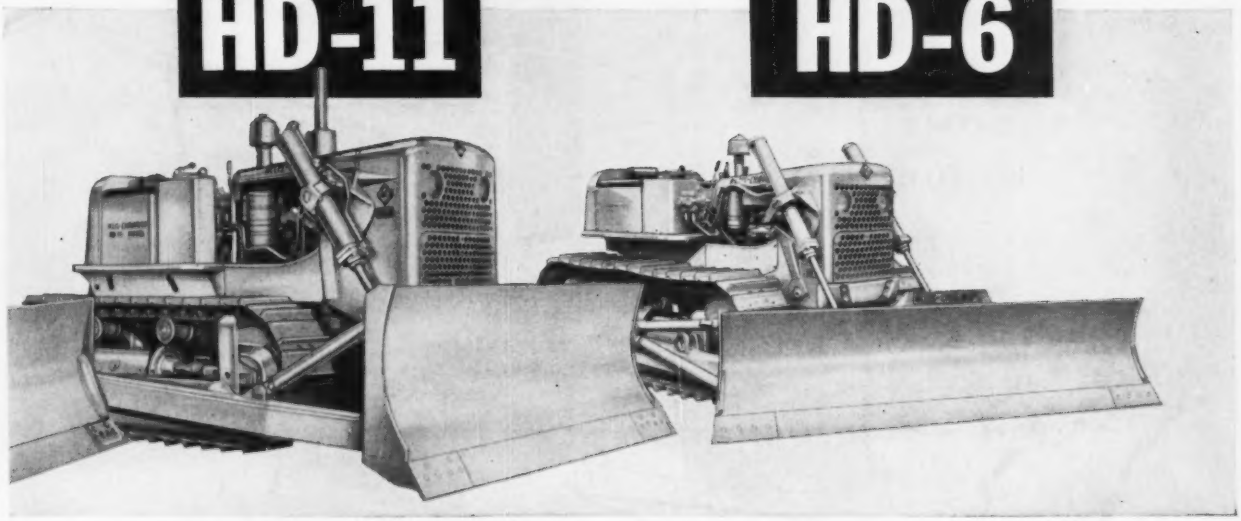
1,000-Hour Lubrication intervals for truck wheels, idlers, support rollers . . . changes daily greasing time into production time.

Look ahead...*move ahead*...and stay ahead

more tough jobs

ALLIS-CHALMERS HD-11

ALLIS-CHALMERS HD-6



94 belt hp

25,960 lb (approx. as shown)

The HD-11 is setting new standards in its size range . . . offers you dozens of work-boosting advantages, including the industry's easiest shift pattern. A single shift takes it from any forward speed to any reverse—gets short-cycle jobs done faster, easier.

HD-11B illustrated—Two other models available

63 belt hp

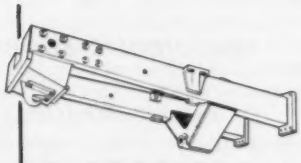
16,470 lb (approx. as shown)

Here's up to 15,500 lb drawbar pull. The HD-6 is the only tractor near its size with big-tractor design advantages—for example, All-Steel Box-A main frame and engine-mounted dozer with direct-lift cylinders for improved weight distribution, accurate dozing and long life.

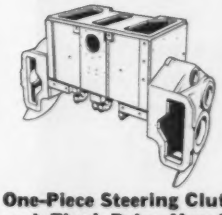
HD-6E illustrated—Three other models available

THAT GIVES YOU ALL THESE ADVANTAGES IN EVERY SIZE

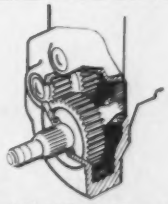
True-Dimension Track heat-treated and machined in the industry's most modern facilities, is setting new track-life records on every type of work.



All-Steel Box-A Main Frame soaks up shock and strain . . . provides improved weight distribution and equipment mounting.



One-Piece Steering Clutch and Final Drive Housing with extreme rigidity and strength . . . line-bored to provide precise alignment of gears and shafts.

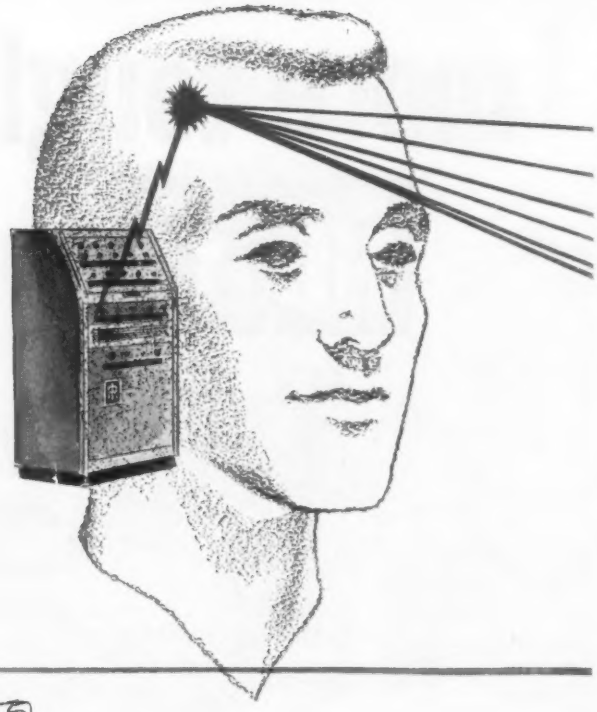


Straddle Mounting of All Final Drive Gears with tapered roller bearings on both sides of short, large-diameter shafts . . . provides extra gear life.

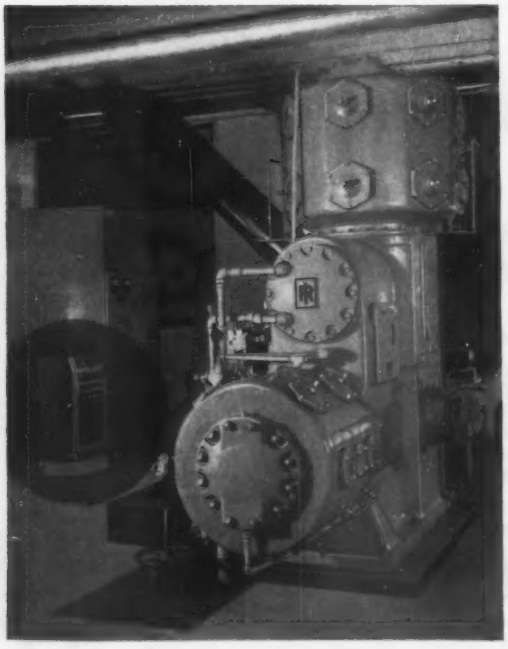
ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

with ALLIS-CHALMERS

MACHINES
THAT
MAKE
ENGINEERING
DREAMS
COME
TRUE



Making a



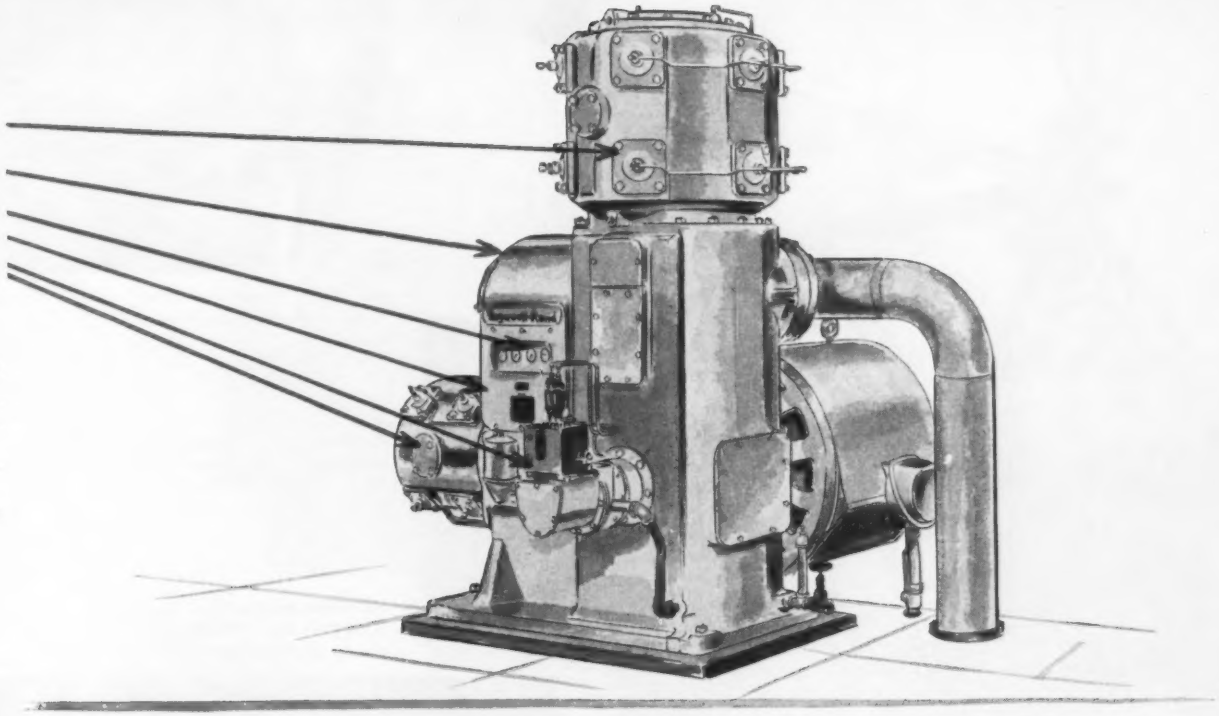
New **'Tendamatic** *control brings*

automatic supervision

to the

COMPRESSOR PLANT

(left) 'Tendamatic control of this two-stage heavy-duty air compressor, an Ingersoll-Rand type XLE packaged unit with built-in motor, assures maximum protection of capital investment, maximum manpower utilization, continuity of production and lower maintenance expense.



Compressor "Think for Itself"

Ingersoll-Rand's new *'Tendamatic* control is like a tireless attendant who keeps inspecting and checking the operation of the compressor every second.

All you need to do is push the "start" button on the control console. The *'Tendamatic* does everything from then on. You walk away knowing that the compressor is in good "hands". And here's why:

This completely automatic control system anticipates operating difficulties before they develop. It keeps an eye on air pressure and temperatures... lubricating-oil pressure and temperature... the cylinder lubricator... checks the float level in the condensate trap. It checks for leaking valves and mechanical failure of running parts.

Anytime there is a variation from normal compressor operation, the *'Tendamatic* identifies the nature of the malfunction and gives you audible and visible warnings in time to take corrective measures. If the warning is ignored or forgotten, *'Tendamatic* shuts down the compressor before any damage results. If oil pressure fails or if any vibration occurs, it stops the machine *at once* without advance warning.

These built-in safeguards entirely eliminate routine inspection and supervision... detect trouble before it can do any harm to the compressor... put all maintenance on a low-cost *preventive* basis.

For almost 90 years, Ingersoll-Rand has been making engineering dreams come true—with the constant improvement of I-R equipment to meet or anticipate the changing needs of America's growing industries. When you need equipment for compressing air or other gases, moving liquids, condensing steam, drilling rock, creating vacuums, or for industrial cooling, *think first of Ingersoll-Rand.*

'Tendamatic control is available only on Ingersoll-Rand air and gas compressors

Ingersoll-Rand

1-817
1-817

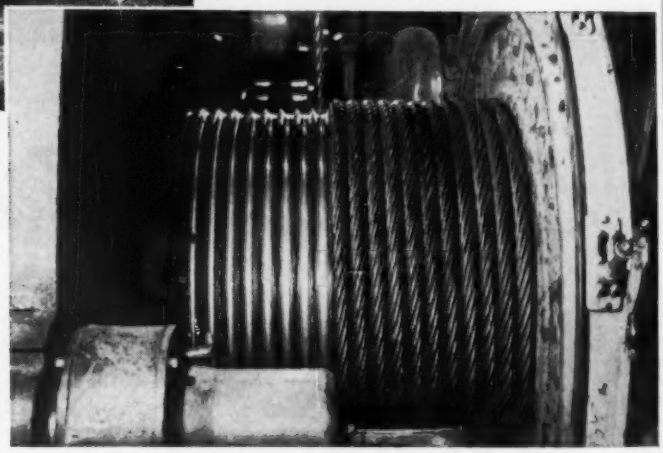
11 Broadway, New York 4, N. Y.

GAS & DIESEL ENGINES • PUMPS • AIR & ELECTRIC TOOLS • CONDENSERS • VACUUM EQUIPMENT • ROCK DRILLS

2⅛" Tiger Brand hoist ropes going through the boom point sheaves.

40-cubic-yard shovel stripping overburden at the Little Sister Mine of the Truax Traer Coal Company, St. David, Illinois.

Main hoist drum with well-lubricated Tiger Brand Rope in excellent condition after long service.



Little Sister Shovel has big "muscles" of American Tiger Brand Wire Rope

This 40-cubic-yard shovel, owned by the Truax Traer Coal Company, has been removing overburden at the Little Sister Mine near St. David, Illinois, for more than nine years. The hoist line is a 550-foot, 2⅜-inch diameter Tiger Brand Wire Rope, and the four boom supports are also Tiger Brand.

During this period, millions of cubic yards of rock and earth have been moved, and the Tiger Brand Wire Ropes have given long service life and dependable operation.

Since this 40-cubic-yard shovel went into service, we have seen the size of big shovels advance to 55, 60 and 70 cubic yards . . . and most of these big strippers are equipped with American Tiger Brand Wire Rope. Why? Because Tiger Brand is quality-controlled from ore mines to finished product under the direction of one of the finest wire rope engineering staffs in the country. They can utilize any of the basic research being conducted by United States Steel Corporation. What's more, they have unsurpassed plant facilities to produce the largest or the smallest wire rope you need. That's why Tiger Brand gives you longest service at least cost.

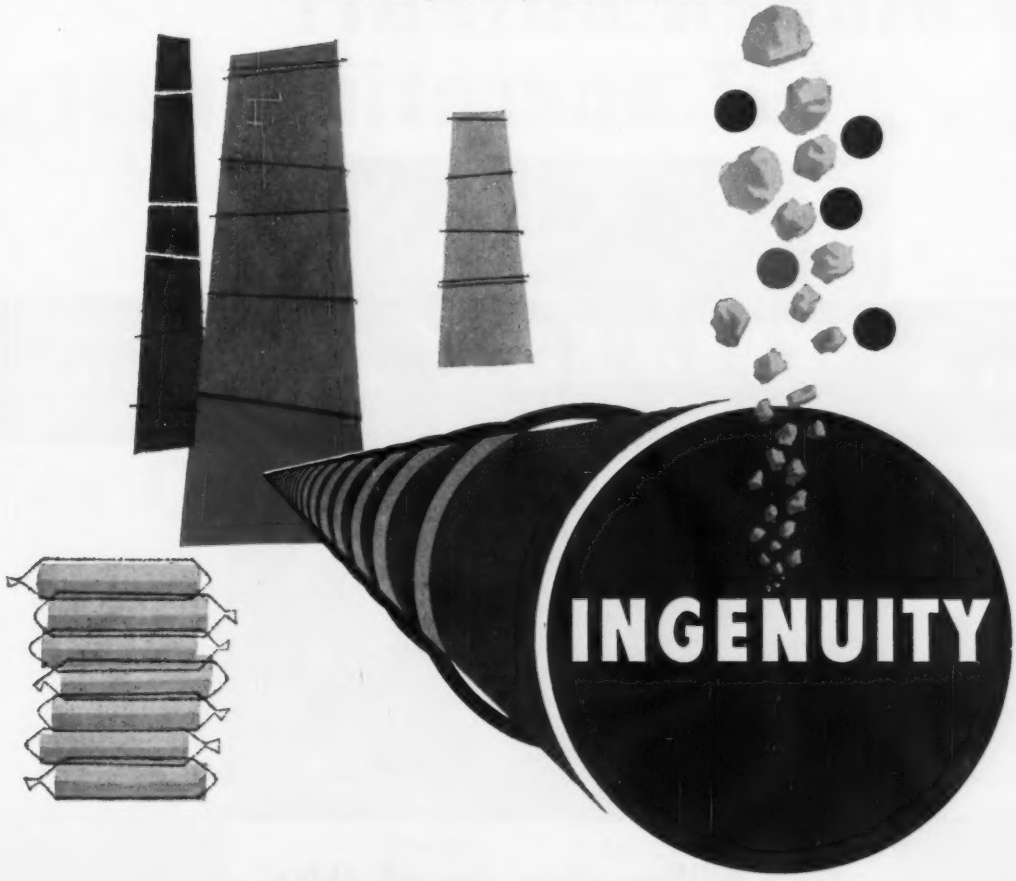
Write now, for our latest booklet on wire rope. American Steel & Wire Division, Rockefeller Building, Cleveland 13, Ohio.

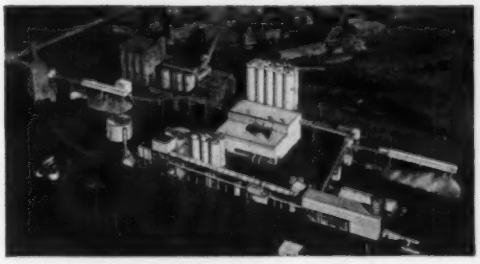
USS and Tiger Brand are registered trademarks

American Steel & Wire Division of USS United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors • United States Steel Export Company, Distributors Abroad

call KE for plant expansion or new facilities





1,250,000 barrel cement plant additi.n recently completed by KE for Marquette Cement, one of world's largest cement producers.

has made KE a major engineer-contractor serving the Minerals Industry

Placing of four fully-lined mills in a few hours instead of days—a unique center pier kiln drive —a 2,700' cement transport "airway." With these and many more planned innovations and short-cuts, Kaiser Engineers completed Marquette Cement's Cape Girardeau plant expansion quickly and economically. Construction cost and time were well below industry average.

Mining, transportation, beneficiation, materials handling, processing in cement, gypsum, coal, ferrous and non-ferrous metals facilities—these are but a few of the fields wherein KE serves the Minerals Industries—from economic analysis through start-up.

KE ingenuity—multi-industry experience, keenly applied—can benefit your next facility. Let us show you how.

KAISER ENGINEERS

engineers—contractors
Contracting since 1914

Division of Henry J. Kaiser Company • Oakland 12, California • New York, Pittsburgh, Washington, D.C., Buenos Aires, Calcutta, Dusseldorf, Montreal, Rio de Janeiro, Sydney, Tokyo

Get HIGHER OUTPUT!
CUT operating costs!

PUT A **WILFLEY** SAND PUMP ON THE JOB!

Only Wilfley gives you all this:

- Maintained high efficiency throughout the life of the pump.
- Quick-change features reduce maintenance costs, minimize downtime.
- Long-wearing parts of hard alloy or abrasion-resistant rubber.
- Simple, efficient packingless design and rugged construction assure continuous, trouble-free operation.
- **Individual engineering on every application**

Wilfley Sand Pumps
"Companions in Economical Operation"
Wilfley Acid Pumps

Write, wire or phone for complete details.

A. R. WILFLEY and SONS, INC.

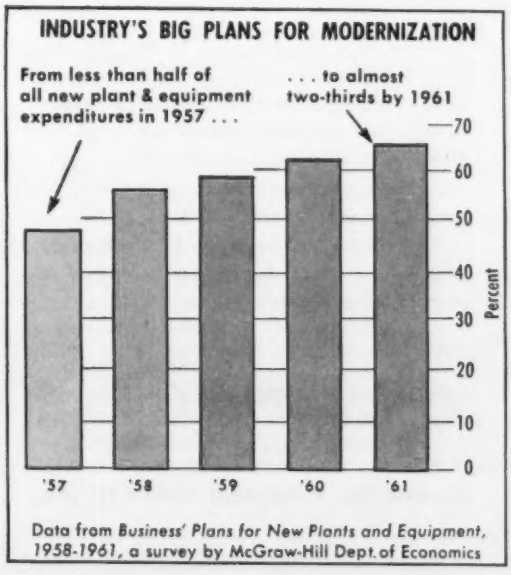
DENVER, COLORADO, U.S.A. - P.O. BOX 2330 • NEW YORK OFFICE: 122 EAST 42ND STREET NEW YORK CITY 17

PLAN '59

A MESSAGE TO AMERICAN INDUSTRY

Modernize Now — For Growth and Profits

The biggest challenge facing American industry today is that of thoroughly modernizing its plant and equipment. This is the test period for companies to prepare for success — or failure — in the '60s. Success depends decisively on one key policy — modernization, for growth and profits.



The problem of business recession is fading. Sales and industrial production are moving up again, slowly. Business is swinging back into its normal course. This is growth, not retreat and recession. If the recovery takes us back to the normal growth trend, industrial production will be up 15% to 20% by 1960.

But how can we get this growth in production without the plague of price inflation that has blighted our economy in recent years? And, of fateful consequence for the individual business firm, how can it keep its costs down enough to make a decent profit — something a very large share of American companies are not doing today?

This is the new challenge that confronts business as the recession is left behind.

Nature of the Challenge

The recent record on costs and productivity is not reassuring. Since 1947 wages in manufacturing have risen 68%, while output per manhour has gone up 32%. This is a dismal record for a nation that has prided itself on

gains in industrial efficiency. Clearly, if we are to avoid continuing inflation, labor must key its wage demands more closely to productivity increases. But clearly, also, we must do far better in raising output per manhour. Otherwise, industry cannot hope to offer stable prices, and still make a profit.

What, then, is the answer? It is modernization of plant and equipment, the replacement of obsolete producing facilities with new and more efficient machinery and buildings. Only in this way can industry hope to increase production, hold down costs and make a good profit showing in the years of growth that lie ahead.

Industry's Answer

The chart on the preceding page shows how American industry is buckling down to the task of modernizing its facilities over the next four years. It is planning to replace old equipment with new machines that will raise output per worker not just 2% or 3% a year, but more like the 5% annual gain in productivity that this nation achieved in the years following World War I.

Since World War II we have had to contend with shortages of capacity and materials that have held back the job of raising productivity. But today the machines and techniques are available. And industry is getting set.

A broad sample of manufacturing companies surveyed by the McGraw-Hill Department of Economics earlier this year reported these plans: **In 1958, expenditures for modernization will rise to 56% of total investment in new facilities — compared to 48% in 1957. And this emphasis will increase until by 1961, expenditures for replacement and modernization account for two-thirds of all capital spending by manufacturing companies.** In dollar terms, manufacturers will spend more on modernization in each of the four years 1958-61 than in any previous year except 1957.

Can It Be Done?

These are big plans. Can they be carried out? Is it too visionary to hope that after a decade of expansion, industry can now find the outlets for huge amounts of capital investment in the area of modernization? The answers are important to business and the nation, because on this new wave of modernization depends our hope of holding down costs and prices, and also the prosperity of the vital capital goods industries — generators of boom and bust in our economy.

To ensure that industry gets the answers, McGraw-Hill's 34 business publications are now starting a coordinated effort — the largest editorial effort in the history of our company — to find, report and publish the opportunities for modernization at a profit, in the fields we serve. These special reports will begin in late September and will run through November, with appropriate coverage for the specific needs of each field. We are proud to share with industry the responsibility for making sure that no opportunity is overlooked in the drive to modernize now for growth and profits.

This message was prepared by the McGraw-Hill Department of Economics as the first step in our company-wide effort to report on opportunities for modernization in industry. The Department is also preparing a longer report, on modernization as a national problem, for publication in October.

Permission is freely extended to newspapers, groups or individuals to quote or reprint all parts of the present text.

Donald C. McGraw
PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

Technical Sessions Star Top Speakers

(All events except as noted, will be held at the Civic Center Exhibit Hall and Civic Auditorium)

MONDAY, SEPTEMBER 22

10:00 A. M. OPENING SESSION

Presiding: JOHN D. BRADLEY, president, The Bunker Hill Co., San Francisco; chairman, Western Division, American Mining Congress

Invocation: THE VERY REVEREND C. JULIAN BARTLETT, Dean of Grace Cathedral, San Francisco

Welcome to San Francisco:
HON. GEORGE J. CHRISTOPHER, Mayor of San Francisco

Responses:
HOWARD I. YOUNG, president, American Zinc, Lead & Smelting Co., St. Louis; president, American Mining Congress
FRANK COOLBAUGH, vice president, Climax Molybdenum Co., Golden, Colo.; national chairman, Program Committee
JACK H. HOW, president, Western Machinery Co., San Francisco; chairman, Manufacturers Division, American Mining Congress
L. C. CAMPBELL, Pittsburgh; chairman, Coal Division, American Mining Congress

Introduction to Distinguished Guests

Presiding: HOWARD I. YOUNG, president, American Mining Congress

Mining and National Security
(Speaker to be announced)

Resolutions Committee Reports:
General Policy
Solid Fuels

2:00 P.M. LABOR RELATIONS

Chairman: KENNETH C. KELLAR, general counsel, Homestake Mining Co., Lead, S. Dak.

National Labor Policies
(Speaker to be announced)

World Labor Policies—The ILO Conference on Mining
DENISON KITCHEL, attorney, Phoenix, Ariz.

Developments in Labor Relations
RUFUS G. POOLE, labor attorney for the potash industry, Albuquerque, N. Mex.

Resolutions Committee Reports:
Labor Relations
Mine Safety
Social Security

2:00 P.M. MILLING AND METALLURGY

Chairman: NORMAN WEISS, milling engineer, American Smelting & Refining Co., Salt Lake City

Autogenous Grinding
HARLOW HARDINGE, president, Hardinge Co., Inc., York, Pa.

New Developments of the Gyratory Ball Mill
A. W. FAHRENWALD, Dean Emeritus, College of Mines, University of Idaho, Moscow, Idaho

Scientific Principles of the Flow of Crushed Material
PHILIP J. ELSEY, assistant director; ANDREW W. JENICKE, director, Bulk Solids Flow Project; and ROSCOE H. WOOLEY, research engineer, Experiment Station, University of Utah, Salt Lake.

The Practicality of Present Day Automation
C. M. MARQUARDT, Industrial Physics and Electronics Co., Salt Lake City

New Trends in Plant Design
R. T. LASSITER, N.Y. district manager, and JAMES H. JANSEN, Western-Knapp Engineering Co., S.F.

EVENING Open—no scheduled entertainment

TUESDAY, SEPTEMBER 23

10:00 A.M. NATIONAL MINERAL POLICIES

Chairman: HON. ED EDMONDSON, U.S. Representative from Oklahoma

Long Range Government Mineral Policies
HON. THOMAS C. MANN, Assistant Under Secretary of State for Economic Affairs
Representative of U.S. Department of Interior

Congressional Views on Mineral Policies
HON. GORDON ALLOTT, U.S. Senator from Colorado
HON. CLAIR ENGLE, U.S. Representative from California; Chairman, House Committee on Interior and Insular Affairs
HON. WILLIAM A. DAWSON, U.S. Representative from Utah

Resolutions Committee Report:
National Mineral Policies

10:00 A.M. UNDERGROUND MINING

Chairman: CHESTER H. STEELE, vice president, Anaconda Co., Butte, Mont.

Report on Survey of Underground Drilling Practices
RAYMOND STEWART, assistant planning engineer, Climax Molybdenum Co., Climax, Colo.

Use of Ammonium Nitrate Underground
JOSEPH B. ELIZONDO, general superintendent of mines, Tri-State Mines, Eagle-Picher Co., Cardin, Okla.

Hydraulic Filling in Underground Mines
RICHARD M. STEWART, assistant to director of mining research, Anaconda Co., Butte, Mont.

Freezing Operations for Shaft Sinking in Saskatchewan
RUSSELL G. HAWORTH, vice president, in charge of production, Potash Co. of America, Carlsbad, New Mex.

Roberts Tunnel Project for the City of Denver
THEODORE F. ADAMS, project manager, Blue River Constructors, Arvada, Colo.

10:00 A.M. OPEN PIT MINING

Chairman: WALTER C. LAWSON, vice president & general manager Phelps Dodge Corp., Douglas, Ariz.

Incline Skip for Open Pit Hoisting
E. D. SPAULDING, resident manager, Pima Mining Co., Tucson, Ariz.

Large Diameter Blasthole Drilling and Blasting
JOHN A. LENTZ, JR., general superintendent, Morenci Branch, Phelps Dodge Corp., Morenci, Ariz.

Drilling and Blasting Taconite
FLOYD W. ERICKSON, manager Babbitt Div., Reserve Mining Co., Babbitt, Minn.
Symposium on Ammonium Nitrate Blasting
JAMES HYSLOP, president, Hanna Coal Co., Div. of Consolidation Coal Co., Cadiz, Ohio
FRANK QUILICI, pit superintendent, Nevada Mines Div., Kennecott Copper Corp., Ruth, Nev.
LEWIS J. PATTERSON, manager Northern Dist., Michigan Limestone Div., U.S. Steel Corp., Detroit
EARL FARNUM, manager of operations, Iron Ore Co. of Canada, Montreal, Que.

2:00 P.M. NATIONAL MINERAL POLICIES

Chairman: HON. WALTER ROGERS, U.S. Representative from Texas; Chairman, Mines and Mining Subcommittee, House Interior and Insular Affairs Committee
Canadian-Mexican Views on Mineral Policies
V. C. WANSBROUGH, executive director, Canadian Metal Mining Assn., Toronto, Ont.
ING. SALVADOR PENA, mining tax branch, Treasury Department, Government of Mexico
Domestic Industry Views on Mineral Policies
CHARLES E. SCHWAB, assistant to president, Bunker Hill Co., San Francisco; chairman, Emergency Lead-Zinc Committee
LAWRENCE LITCHFIELD, JR., vice president, Mining Div., Aluminum Co. of America, Pittsburgh
S. H. WILLISTON, executive vice president, Cordero Mining Co., Palo Alto, Calif.
CLYDE L. FLYNN, JR., Arlington, Va.
CHARLES J. POTTER, president, Rochester & Pittsburgh Coal Co., Indiana, Pa.
HORACE M. ALBRIGHT, director, U.S. Borox & Chemical Corp., New York, N.Y.
Resolutions Committee Report:
Mine Financing

2:00 P.M. MILLING AND METALLURGY

Chairman: FRED D. DEVANEY, chief metallurgist, Pickands Mather & Co., Duluth, Minn.
Production of Metallic Iron Concentrates Involving Direct Reduction
ALEX STEWART, president retired, R. N. Corp., New York
Dry Magnetic Concentration Methods
P. E. CAVANAUGH, director of metallurgy, Ontario Research Foundation, Toronto, Ont.
Remarks on Some Advances in Uranium Ore Processing
WILLIAM L. LENNEMAN, metallurgical engr., raw materials division, U.S. AEC, and FRANK E. MCGINLEY, chief, procurement services branch, AEC Grand Junctions Operations Office.
Improvements in Filtration
ROBERT B. THOMPSON, Filter Div., Eimco Corp., Salt Lake City
Refinements in Uranium Metallurgy
Speaker to be announced
New Trends in Plant Design
R. T. LASSITER, district manager, Western-Knapp

2:00 P.M. SAFETY AND HEALTH

Chairman: MARLING J. ANKENY, director, U.S. Bureau of Mines
The Science of Mine Ventilation
JOHN W. WARREN, chief ventilation & industrial hygiene engineer, Anaconda Co., Butte, Mont.
Future Aspects of Underground Ventilation
Raymond Mancha, vice president retired, Joy Manufacturing Co., Pittsburgh
Safety in the Mining Organization
CHARLES R. KUZELL, director, Phelps Dodge Corp., Phoenix, Ariz.
Evaluation of Radiation Hazards in Uranium Mining
DUNCAN A. HOLADAY, director, Occupational Field Station, U.S. Public Health Service, Salt Lake City
Costs of Mine Accidents
R. WESTLUND, chief safety engineer, Argonaut Insurance Co., Menlo Park, Calif.

6:30 P.M. MINERS JAMBOREE— "Chuck Wagon" Dinner

Palace of Fine Arts

WEDNESDAY, SEPTEMBER 24

10:00 A.M. TAX PANEL

Chairman: HON. THOS. E. MARTIN, U.S. Senator from Iowa
HON. HALE BOGGS, U.S. Representative from Louisiana
ELLSWORTH C. ALVORD, Alvord & Alvord, Washington, D.C.; tax counsel, American Mining Congress
Other speakers to be announced
Resolutions Committee Reports:
Taxation
Government Expenditures
Gold, Silver and Monetary Policies
Co-Chairmen:
DONALD H. MCLAUGHLIN, president, Homestake Mining Co., San Francisco; chairman, Gold Producers Committee, American Mining Congress
JOSEPH T. HALL, president, Callahan Zinc-Lead Co., Inc., New York
Gold
(Speaker to be announced)
U.S. Silver Policy
HON. ALAN BIBLE, U.S. Senator from Nevada
Observations on Silver
D. L. FEATHERS, vice president & secretary, Bunker Hill Co., San Francisco
Resolutions Committee Report:
Gold, Silver and Monetary Policies

10:00 A.M. UNDERGROUND MINING

Chairman: ELMER A. JONES, division manager, St. Joseph Lead Co., Boone Terre, Mo.
Longwall Stoping with Yieldable Steel Props at the Radon Mine
WILLIAM H. LOVE, manager of mines, Hcla Mining Co., Wallace, Idaho, and Philip Lindstrom, superintendent of Utah operations, Moab, Utah
Mechanical Mining in Eastern Tennessee
HARRY L. MILLER, superintendent, Jefferson County operations, American Zinc Co. of Tenn., Mascot, Tenn.
Why the Circular Shaft?
WILLIAM F. SHINNERS, manager, Michigan mines, M.A. Hanna Co., Iron River, Mich.

Use of Metal Liners in Ore Passes
ROBERT W. BRAUND, manager of Michigan mines, and R. L. BALCONI, superintendent, Tracy mine, Jones & Laughlin Steel Corp., Negaunee, Mich.
Mining by Hydraulic Jet
JOHN H. BAKER, superintendent, American Gilsonite Co., Salt Lake

12:15 P.M. STRATEGIC MINERALS LUNCHEON—
Hotel Whitcomb
Presiding: S.H. WILLISTON,
Cordero Mining Co., Palo Alto, Calif.; chairman, Strategic Minerals Committee, AMC
Guest Speaker: HON. HENRY C. DWORSHAK, U.S. Senator from Idaho

2:00 P.M. PUBLIC LANDS

Chairman: To be announced
Impact of Recent Court Decisions on the "Rule of Discovery"—A Panel Discussion
RAYMOND B. HOLBROOK, counsel, U.S. Smelting Refining & Mining Co., Salt Lake City
ROBERT S. PALMER, executive vice president, Colorado Mining Assn., Denver
R. LAUREN MORAN, attorney, Riverton, Wyo.
OSCAR W. WORTHWINE, attorney, Boise, Idaho
HON. ELMER F. BENNETT, solicitor, U.S. Department of the Interior
Developments Under Public Law 167—The "Multiple Use" Act of 1955
HON. EDWARD WOOZLEY, administrator, Bureau of Land Management
Proposed Changes in Assessment Work Requirements
W. HOWARD GRAY, attorney, Ely, Nev.; chairman, Public Lands Committee, AMC
Land Withdrawal Policies
HON. PHIL R. HOLDSWORTH, Territorial Commissioner of Mines, Juneau, Alaska
Resolutions Committee Reports:
Public Land Policy
Water and Air Pollution

2:00 P.M. RESEARCH AND EDUCATION

Chairman: LEE A. DUBRIDGE, president, California Institute of Technology, Pasedena, Calif.
Nuclear Explosions —Possible Mining Applications
GERALD W. JOHNSON and DAVID D. RABB, University of California Radiation Laboratory, Livermore, Calif.
The Role of Research in Marketing Nonferrous Metals
W. M. PEIRCE, assistant to executive vice president, New Jersey Zinc Co., New York
Research on New Uses for Mineral Products
R. H. THIELEMANN, chairman Dept. of Metallurgy, Stanford Research Institute, Menlo Park, Calif.
Suppy, Demand and Future Outlook for Mining Engineers
JOHN W. VANDERWILT, president, Colorado School of Mines, Golden, Colo.

2:00 P.M. OPEN PIT MINING

Chairman: To be announced
Over-All Berkeley Pit Operation
E. I. RENOUARD, manager of mines, Anaconda Co., Butte, Mont.
Progress at the Black Lake Asbestos Project
VICTOR I. MANN, vice president, Asbestos of Quebec, Ltd., New York
Truck Haulage Improvements
J. C. VAN DE WATER, general Superintendant of mines, Ray Mines Div., Kennecott Copper Corp., Ray, Ariz.
L. J. MORGAN, mobile equipment supervisor, M. A. Hanna Co., Hibbing, Minn.
Planning and Scheduling Maintenance
JAMES A. VITZTHUM, superintendant of maintenance Oliver Iron Mining Div., U.S. Steel Corp., Virginia, Minn.
Modern Open-Pit Methods and Equipment
LEWIS A. PARSONS, consulting Engineer, Calaveras Cement Co., San Francisco

EVENING OPEN—no scheduled entertainment

THURSDAY, SEPTEMBER 25

1:00 A.M. STATE OF THE METAL MINING INDUSTRIES

Chairman: FRANK COOLBAUGH, vice president, Climax Molybdenum Co., Golden, Colo.; national chairman, program commitee
Nonferrous Metals
SIMON D. STRAUSS, vice president, American Smelting & Refining Co., New York
Iron Ore
HERBERT C. JACKSON, managing partner, Pickands Mather & Co., Cleveland
Light Metals
WALTER L. RICE, president, Reynolds Mining Co., Richmond, Va.
Strategic Metals
F. A. MCGONIGLE, assistant to president, Howe Sound Co., New York
Rare Metals
MITCHELL H. KLINE, vice president, Rare Metals Corp. of America, Salt Lake City
Uranium
ALLAN E. JONES, manager, Grand Junction Operations Office, U.S. Atomic Energy Commission, Grand Junction, Colo.
Boron
J. FREDERICK CORKILL, vice president and general manager, Pacific Coast Borax Co. Div., U.S. Borax & Chemical Corp., New York
Resolutions Committee Report:
Uranium

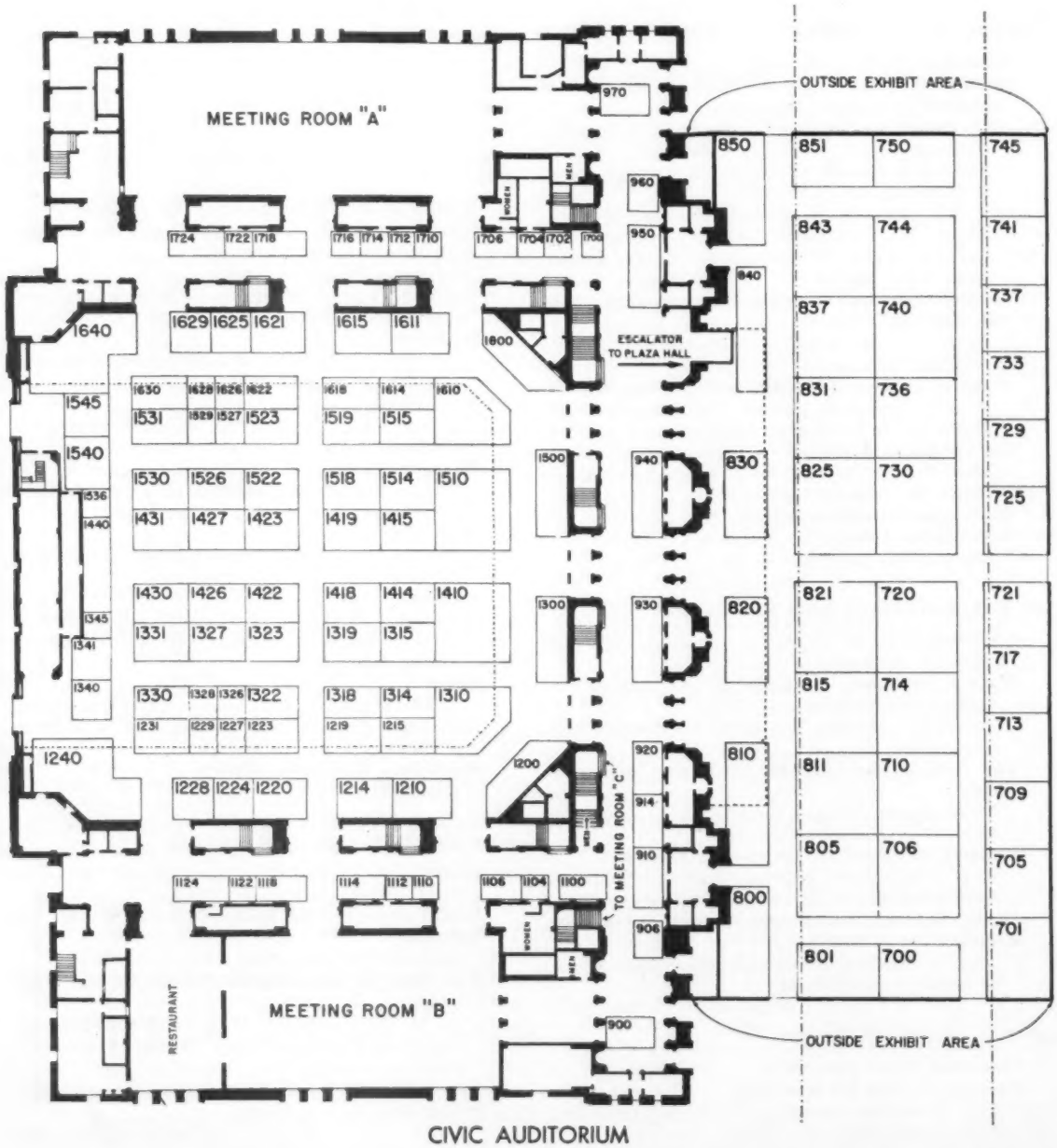
10:00 A.M. INDUSTRIAL MINERALS

Chairman: C. E. WUERPEL, vice president, Marquette Cement Manufacturing Co., Chicago
Imoact of the Federal Road Program on the Mineral Industries
Speaker to be announced
Raw Material Requirements for the Federal Road Program
C. M. (MAX) GILLISS, director of Public Works, California Dept. of Public Works, Sacramento, Calif.
Application of Silicone Treated Glass Bags for Collecting Dust in Hot Gases

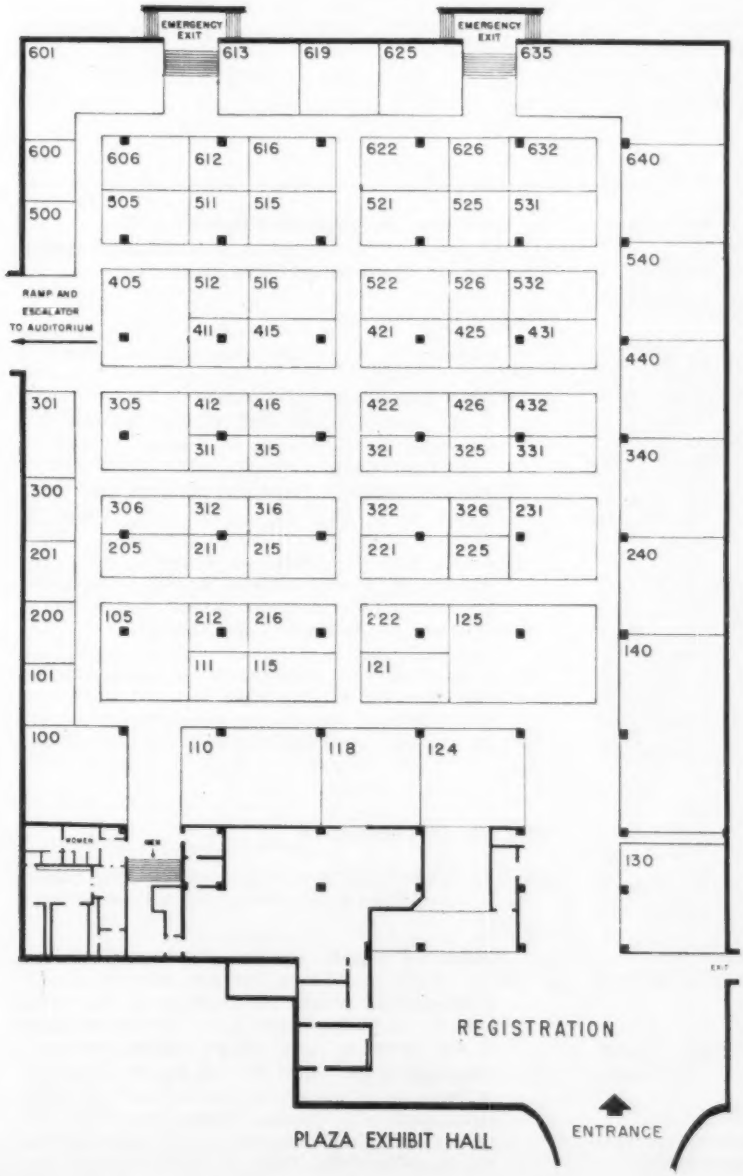
(*Continued on p 88*)

Your Guide for New Products, New Ideas

Acme Hamilton Mfg. Corp., (Hamilton Rubber) Acme Pacific Div. 1704
Aeroquip Corp., Western Div. . . 1124
Aero Service Corp. 1219
Allen-Sherman-Hoff Pump Co. . 1615
Allis-Chalmers Mfg. Co., Construction Machinery Div. 130-140-240
Alloy Steel & Metals Co. 412
American Air Filter Co., Inc. . . . 111
American Brattice Cloth Corp. . 1536
American Cyanamid Co. 1415
American Manganese Steel Div., American Brake Shoe Co. 215
American Mine Door Co. 625
Atlas Copco Pacific, Inc. 222
Atlas Powder Co. 1300
Baldwin-Lima-Hamilton Corp., Construction Equipment Div. . . . 225
Band-It Co. 940
Barber-Greene Co. 211
Barrett, Haentjens & Co. 1310
Bemis Bro. Bag Co. 1712
Bendix Aviation Corp. 1104
Bethlehem Pacific Coast Steel Corp. 322
Bixby-Zimmer Engineering Co. . 1223
Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Inc. 1630
Boyles Bros. Drilling Co., Ltd. . . 431
Broderick & Bascom Rope Co. . 1419
Brown, Inc., David 1224
Brunner & Lay Rock Bit Corp. . 1611
Bucyrus-Erie Co. 1610
Buell Engineering Co., Inc. . . . 1709



Bush Engineering & Mfg. Co. . .1340
C & D Batteries, Inc. 1211
Card Iron Works Co., C. S. 1106
Carpco Mfg. Inc. 521
Caterpillar Tractor Co. (Athey Products) 825-831-837
Chicago Pneumatic Tool Co. . . .740
Christensen Diamond Products Co. 1220
Clark Equipment Co., Construction Machinery Div. 500-600-601
Coast Mfg. & Supply Co. 1706
Colorado Fuel & Iron Corp. . . .1640
Connellsville Mfg. & Mine Supply Co. 950
Continental Motors Corp. 1629
Contract Engineering Co. 950
Crucible Steel Co. of America 306-312-316
Cummins Engine Co., Inc. 640
Curtiss-Wright Corp. 632
Denver Equipment Co. 515
Derrick Mfg. Co. 950
Detroit Diesel Engine Div., General Motors Corp. 415-516
Diamond Iron Works Div., Goodman Manufacturing Co. 1423
Diamond Tool Research Co., Inc. 1716
Dow Chemical Co. 1526
Du Pont de Nemours & Co., Inc., E. I. 1210
Eimco Corp. 125
Electric Steel Foundry Co. 1330
Electric Storage Battery Co., Exide Industrial Div. 1228
Engineering & Mining Journal . .1618
Equipment Engineers Inc. 101
Euclid Div., General Motors Corp. 714-720-815-820-821
Fairchild Aerial Surveys, Inc. . .1229
Firth Sterling Inc. 1411
Flexible Steel Lacing Co. 1518
Galigher Co. 1600
Gardner-Denver Co. 231
Gates Rubber Co. 1440
General Cable Corp. 1628
General Electric Co., Apparatus Sales Div. 1314-1318
Goodman Co., Div., Berg Hedstrom & Co., Inc. 908
Goodman Mfg. Co. 1423-1427
Goodrich Industrial Products Co., B. F. 626
Gould-National Batteries, Inc., Industrial Div. 326
Griphoist, Inc. 1717
H & L Tooth Co. 511
Hardinge Co., Inc. 1200
Harnischfeger Corp. 1410-1414-1315
Hawthorne, Inc., Herb J. 411
Hercules Motors Corp. 1431
Hercules Powder Co. 1345
Hewitt-Robins 422-426-432
Hughes Tool Co. 930
Humphreys Engineering Co. . . .1540
Industrial Nucleonics Corp. 317
Industrial Physics & Electronics Co. 606
Ingersoll-Rand Co. 522-526-532
International Harvester Co. 340-440
International Nickel Co., Inc. . . .622
Iowa Mfg. Co. 744
Jaeger Machine Co. 100
Jeffrey Mfg. Co. 321-325-331
Johnson March Corp. 1331
Joy Mfg. Co. . . . . 405 & 736
KW-Dart Truck Co. 810-811
Kennametal Inc. 200
Koehring Co., Koehring Div. 1323-1422
Le Roi Div., Westinghouse Air Brake Co. 121
Leschen Wire Rope Div., H. K. Porter Company Inc. . . . . 1515 & 1519
LeTourneau, Inc., R. G. . . . . 713-717-721 & 629
LeTourneau-Westinghouse Co. . .540
Link-Belt Co. 311
Longyear Co., E. J. 920
Los Angeles By-Products Co., Los Angeles Steel Casting Co. . . .525
Ludlow-Saylor Wire Cloth Co. . .1626
Machinery Center, Inc. 1724
Mack Trucks, Inc. 118-124
Macwhyte Wire Rope Co. 1117
Mancha Storage Battery Locomotive Div., Goodman Mfg. Co. 1423
Manning Co., Charles E. 1100
Marion Power Shovel Co. 205
Mine Safety Appliances Co. 1500
Mining Congress Journal 1114
Mining World 1714
Mission Mfg. Co. 212
Mobile Drilling, Inc. 709
Nagle Pumps, Inc. 221
National Filter Media Corp., Western Div. 1118
National Malleable & Steel Castings Co. 115



YOUR GUIDE TO THE SHOW

National Supply Co. 1231
Nordberg Mfg. Co. 1523-1527
Northwest Engineering Co. 1625
Ohio Brass Co. 1215
Olin Mathieson Chemical Corp., Explosives Div. 1529-1531
Ore & Chemical Corp. 914
Pioneer Engineering Division of Poor & Co. 216
Pit & Quarry Publications 608
Plastic Wire & Cable Corp. 1125
Plummer Co., Walter A. 1110
Porter Company, Inc., H. K. 1515-1519
Productive Equipment Corp. 1326-1328
Quaker Rubber Div., H. K. Porter Company, Inc. 1515
Raybestos-Manhattan, Inc. 1418
Red Jacket Co., Inc. 1109
Reich Bros. Mfg. Co., Inc. 730
Ridge Tool Co. 900
Rock Products Magazine 1702
Roebling's Sons Corp., John A. 416
Rust-Oleum Corp. 1122
Sanford-Day Iron Works, Inc. 840
Sika Chemical Corp. 1700
Simplex Wire & Cable Co. 1214
Skookum Co., Inc. 1227
Smidth & Co., F. C. 616
Southwestern Engineering Co. 223
Spencer Chemical Co. 1112
Stanco Mfgrs. & Sales, Inc. 621
Standard Steel Corp. 1545
Stearns Magnetic Products 1718
Stephens-Adamson Mfg. Co. 1322
Stoody Co. 1240
Stratoflex, Inc. 705
Thermoid Co. 512
Thomas Flexible Coupling Co. 960
Thor Power Tool Co. 842-1510-1514
Timken Roller Bearing Co. 1530
Tool Steel Gear & Pinion Co. 1710
Traylor Engineering & Mfg. Co. 1319
Twin Disc Clutch Co. 612
Tyler Co., W. S. 1426
Union Wire Rope Corp. 614
United States Rubber Co. 505
United States Steel Corp. 300-301
Universal Engineering Corp. 531
Varel Mfg. Co. 1341
Vascoloy-Ramet Corp. 421
Victaulic, Inc. 1622
Vulcan Iron Works Co. 1614
Wedge Wire Corp. 1621
Western Gear Corp. 425
Western Insulated Wire Co. 1722
Western Machinery Co. 105
Western Rock Bit Mfg. Co. 315
Westfall Equipment Co. 910
Westinghouse Electric Corp. 305
Wheelabrator Corp. 1430
White Motor Co. 843
Wild Heerbrugg Instruments, Inc. 906
Willys Motors, Inc. 619
Wooldridge Mfg. Div., Continental Copper & Steel Industries 725-729
Yuba Consolidated Industries, Inc. 733-737

AMC PROGRAM (*Continued from p 85*)

GORDON BARR, production engineer, Southwestern Portland Cement Co., Los Angeles

Use of Industrial Minerals in Basic Refractories

JAMES C. HICKS, research director, Chemical Div., Kaiser Aluminum & Chemical Corp., Oakland

10:00 A.M. EXPLORATION AND GEOLOGY

Chairman: PETER JORALEMON, consulting geologist, San Francisco

Exploration of Large Areas

Speaker from M. A. Hanna Co.

Exploration at INCO

Ralph D. Parker, vice president, International Nickel Co. of Canada, Ltd., Toronto, Ont.

Geophysical Exploration Methods

LOUIS B. SLICHTER, director, Institute of Geophysics, University of California, Los Angeles

Exploration Drilling Techniques

V. N. BARNHART, vice president, E. J. Longyear Co. Minneapolis

12:15 P.M. LUNCHEON, BOARD OF GOVERNORS, WESTERN DIVISION

A.M.C.

Nob Hill Room, Fairmont Hotel

2:00 P.M. MANAGEMENT PROBLEMS

Chairman: C. D. MICHAELSON, general manager, Western Mining Divs., Kennecott Copper Corp., Salt Lake

The Role of Engineering in Management

TOM WARE, president, International Minerals & Chemical Corp., Chicago

Long Range Open Pit Planning

ADOLPH SODERBERG, consulting engineer, Mining, Western Mining Divs., Kennecott Copper Corp., Salt Lake City

Sequence of Training Young Engineers

R. D. HAWAKANSON, vice president, Oliver Iron Mining Div., U.S. Steel Corp., Duluth, Minn.

Supervisory Development Program

JOHN M. PETTY, assistant general superintendent, Climax Molybdenum Co., Climax, Colo.

2:00 P.M. URANIUM

Chairman: D. W. VILES, vice president, Vanadium Corp. of America

Nuclear Energy and the Future

R. D. BENNETT, manager, General Electric Co., Durango Colo., Vallecitos Atomic Laboratory, Pleasanton, Calif.

Texas-Zinc Minerals Project at Mexican Hat

NEILL K. BANKS, general manager, Texas-Zinc Minerals Corp., Grand Junction, Colo.

Open-Pit Uranium Mining in Wyoming

ALBERT V. QUINE, general manager, Lucky Mc Uranium Corp., Riverton, Wyo.

Symposium on Ambrosia Lake Mining—

The problems

RAY JENKINS, superintendent of mines, Phillips Petroleum Co., Grants, N.M.

Other speakers to be announced

7:00 P.M. A.M.C. DINNER DANCE—*Sheraton-Palace Hotel*

*FRIDAY, SEPTEMBER 26

9:30 A.M. to 4:30 P.M. TAX FORUM—open to all interested mining men Golden Empire Room, Mark Hopkins Hotel

Chairman: LINCOLN ARNOLD, chairman, Tax Committee, American Mining Congress

Discussion of current tax problems of the mining industry—including such items as determination of the "property" upon which depletion is based; provisions of the "Mills Bill" of interest to mining; methods of allocation of indirect expenses; and other matters of general interest to mining taxpayers—with ample opportunity for questions and discussion from the floor.

Modern Equipment to Cut Your Costs

New Products Increase Output

The following pages of the Pre-Show Issue are devoted to new equipment designed for the mining industry. In today's metal and mineral climate, only the modern and cost-conscious operator can compete economically. Check this listing of new products and services for applications in your own mine and plant.

How to Use This Issue

E&MJ canvassed all the exhibitors at the San Francisco show and a large number of other equipment manufacturers. Two questions were asked: "What new products are you offering to the mining industry?" and "How can your new product help *E&MJ*'s readers cut costs and improve efficiency?" We've written up the replies in the following pages, providing the AMC Booth Number where the firm is an exhibitor. Equipment is generally grouped under the headings of exploration, breaking, haulage and materials handling, mineral processing, power, and auxiliary equipment. Whether you attend the Show or not, you'll find new cost-cutting ideas to help you with your own mining problems.

Stopping the Dust Problem

Western Precipitation Corp. announces the Turbulaire-Doyle wet scrubber for dust collection in process circuits or in ventilation circuits and a new rapper control system for Cottrell electrical precipitators. The scrubber impinges dust laden gas at high velocity into a pool of scrubbing liquid. It is said to have high dust collection efficiency with low pressure drop, minimum maintenance and wide adaptability to cooling, scrubbing and cleaning. The rapper control permits adjusting frequency, intensity and pattern.

Johnson-March Corp. will show their dust control and gas scrubbing equipment. The Chem-Jet dust control system is designed for raw materials handling operations. Their Type-A Hydro-Precipitator is a high efficiency gas scrubber. And their Chem-Jet Verticone conditioner fits all types of raw materials unloading operations where dust control is needed. These systems are said to provide highly effective dust control at low cost. These will be shown in Booth No. 1331.

Joy Manufacturing Co. will show their "in-the-duct" dust collector, the Microdyne. This very compact, efficient device is creating considerable interest for use in "tight" areas to cleanse and recirculate air for better ventilation. It employs only a small amount of water and a fan. Their well-known Axivane mine fans will also be displayed. Stop at Booth No. 405.

Tubing and Brattice Cloth

American Brattice Cloth Corp. Safety and ventilation engineers should check this booth for equipment including ABC Neolon ventilation tubing, ABC spiral-wire reinforced tubing and brattice cloths made of jute, plastic and cotton. Pick up or write for brochures on ABC brattice cloth, and Neolon tubing. Booth No. 1536.

For Personnel Safety

Mine Safety Appliances Co. will feature fluorescent fixtures, Edison electric cap lamps, respiratory and breathing apparatus including the McCaa two-hour self-contained oxygen unit with approved full-vision facepiece. Their complete line of personnel protective equipment will also be shown. This includes the Skullgard hard hats, goggles of many types, and other clothing and ventilation instruments. On view at Booth No. 1500.

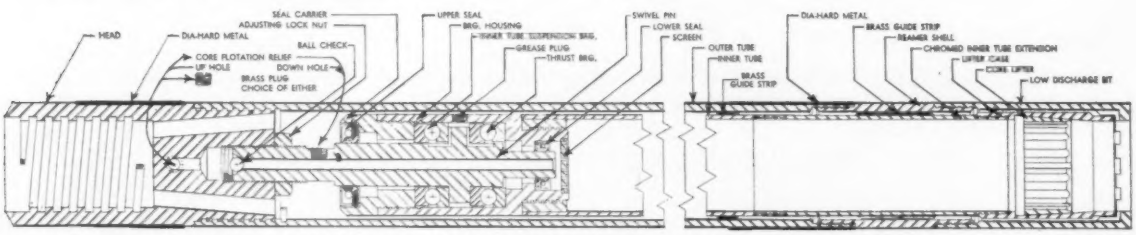
Holding the Roof

Rockiron Co., Ltd. during the last two years has introduced the T. H. yielding steel arch, which can be supplied in seven section weights ranging from 8.6 lb per ft to 29.5 lb per ft. It reports that present world consumption is approximately 17,000 tpm. Officials of the firm believe that the T. H. yieldable arch will maintain a mine opening under heavy ground pressure for the longest time of any support. In addition, repairs are simple, and the arch is readily recoverable. They are used in Canadian iron, nickel and asbestos mines, and in some of the iron mines in Northern Michigan.

Automatic Fire Protection

Grinnell Co. has published one of the most complete booklets available on "Special Hazard Fire Protection." The booklet, containing specifications and recommended practices, covers application and action of water spray, foam, carbon dioxide and dry chemical in fire-fighting at hazardous locations and in dangerous conditions. Complete descriptions are included.

Core Barrel for a Range of Jobs

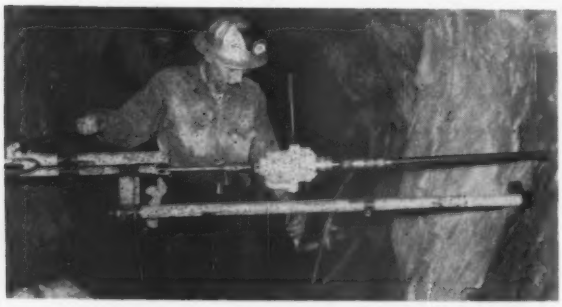


Diamond Drill Contracting Co. will show you their HW Series Hi-Recovery Core Barrel on request. Core barrel head, shown in cutaway above, is designed to take the new "W" Series rods. Ample fluid space for mud drilling is provided in the full length of the barrel. Three types of bit are available—low discharge for general coring, face discharge for friable formations and a clay bit. Bit sizes available are stated as AX, BX and NX.

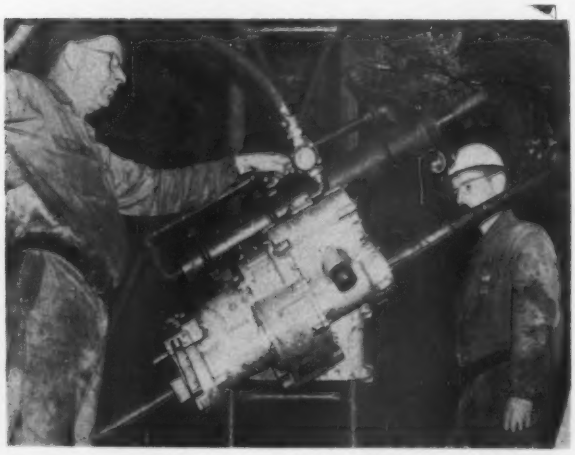
Improved Diamond Bits

Wheel Trueing Tool Co. will share the Joy Manufacturing booth to the extent that Joy will show Wheel Trueing's new diamond drill bits, casing bits, casing shoes and reaming shells. Wheel Trueing continues its service to industry with improved matrix and diamond patterns. Spend some time studying them at Booth No. 405.

For Underground Exploration

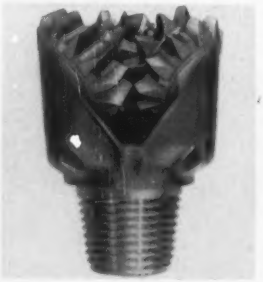


Diamond Drill Contracting Co. announced the Super Scout—lightweight, underground core drill. Super Scout can drill to 60 ft in hard formations, and to 100 ft in most cases with 90% core recovery. Drill is operated by a 2hp piston-type air motor, and comes with water swivel, chuck and 10 ft each of water and air hose (with valves).



Joy Manufacturing Co. will demonstrate operation of their No. 22 gasoline-driven exploration diamond core drill in their outside booth. Inside will be a new model No. 25 air-driven 14-hp diamond drill for long hole coring or blasthole work off of a column. See Booth No. 736 and 405.

Roller Bits



Herbert J. Hawthorne, Inc. will exhibit Hawthorne's Blue Demon cone-type roller rock bits which through new and improved methods of heat treating, hard metal application and quality control cut drilling cost per foot of hole. Check Booth No. 411 or write to the company for more details.

Cutting Exploration Costs

Aero Service Corp.'s display will show how air surveys, airborne geophysics, photo-geology, photo interpretation, plastic models and aerial topographic mapping save time, money and manpower in mine exploration and development programs. Booth No. 1219.

Fairchild Aerial Surveys, Inc. plans to feature its airborne exploration tool—the helicopter-borne electromagnetic surveying system (EM) which is used for the detection and discovery of conductive orebodies (mostly sulphides). Airborne EM can reduce exploration costs by covering rough and inaccessible terrain easily and quickly at low cost per acre explored, says Fairchild. Booth No. 1229.

Deep Drilling With Diamonds

E.J. Longyear Co. is presenting a new, lighter, yet more powerful Wolverine air drill, the Model 44 diamond core drill for deep hole drilling. Along with the "44", Longyear will display diamond bits and several sizes of the Longyear Wire Line core barrel. One section of the booth will be devoted to the firm's consulting services, with emphasis on the use of photogeology. Booth No. 920.

Boyles Bros. Drilling Co. Ltd. of Canada will show a wide range of drills and equipment. Among the new machines will be a deep hole diamond drill with fluid drive, hydraulic reversing unit, centralized power operated controls for both drill and auxiliary equipment for drilling quickly and easily to 5,000 ft.

Also you'll see the Bazooka—lightweight, air-powered diamond drill with eye bolt anchor and bipod mounting features. Mining bars and sprags are eliminated in the Bazooka. Booth No. 431.

Surveying Underground

Kern Instruments Inc. says their internally-wired-for-electric-illumination theodolites can greatly ease and speed underground surveying. Their all-metal tripods are another aid because they will not swell up or rot, and in addition have high reflectivity for easy visibility under poor light and thus prevent accidents to men and equipment.

Wild Heerbrugg Instruments Inc., from its large line of surveying instruments, will dedicate its booth at the Show to the T-16 theodolite, which incorporates design features particularly useful in mining surveys. The battery box, which is an accessory to the T-16, not only illuminates the circle readings and telescope reticule, but also the level vials of the instrument, so that no supplementary light is needed for underground use. T-16 has a direct scale micrometer marked to the nearest minute with easy interpolations to 20 seconds or 15 seconds simply effected. Wild Heerbrugg will also display surveying accessories, including the 90-deg Pentagonal Objective Prism, for shaft surveying. Booth No. 906.

New Lightweight Drills

Acker Drill Co., Inc. has introduced three new items for the prospector and exploration engineer: (1) The Packsack drill shown above weighing only 300 lb complete, (2) the lightweight Hillbilly core drill with depth capacity of 400 ft, and (3) the Presidente core drill which has a capacity of 4,000 ft of AX hole. Brochures are available describing and illustrating the Packsack and Hillbilly drills. The Presidente line will be available late this year.

Mobile Drilling Co., Inc. has its Model B-40 "Explorer" mobile drill scheduled for display. The new drilling unit, according to Mobile, is one-man operated and furnished for mounting on any type of conveyance of ½-ton capacity. It's light in weight and multi-purpose for diamond drilling to 500 ft, auger drilling to 75 ft, and large diameter boring to one stroke depth of 5 2/3 ft. Booth No. 709.

New Dustless Stoper

Ingersoll-Rand Co. will show an extensive range of its products at its booths at the Show. The list is highlighted by four different sizes of the famed "down-hole" drill, and also features the new DHD-500, the new Vacujet dustless stoper, the self-propelled Hydra-Boom drilling rig, Carset drill bits, carburized jackrods, jackbit grinders, tugger hoists, Impactools, sump pumps, air cranking motors, mine dewatering pumps and the I-R stationary compressor. There'll be a number of representatives of the company on hand to answer all your questions. Booth No. 522,526,532.

Diamond Types and Sizes

Diamond Tool Research Co., Inc. says "our DTR exhibit at the 1958 Mining Show offers four major points of interest—(1) a continuous sound movie entitled 'Mining of Diamonds in South Africa'; (2) a complete sample line showing coring, non-coring, casting and reaming shell bits in many sizes; (3) an interesting and informative display of five grades of loose diamonds used in DTR bits; and (4) actual samples from the broad line of DTR diamond products." Booth No. 1716.

Quick Reading Mag

Varian Associates, Instrument Division says its M-49 portable magnetometer detects variations in the earth's magnetic field which reveal magnetic orebodies, subsurface faults and structural anomalies, and gives an automatic reading every six seconds without the need for leveling, calibration or orientation in azimuth. It operates continuously when carried by man, pack animal, motor vehicle or boat. Sensitivity is plus or minus 10 gammas; range is 19,000 to 100,000 gammas. The Varian proton-free-precession principle, newly applied to this type instrument, achieves the combination of sensitivity, light weight and freedom from leveling requirements, according to Varian.

Prospector's Burro on Wheels

Willys Motors, Inc.'s exhibit will be built around the latest models of their Universal Jeep and the Jeep station wagon. These 4-wheel drive vehicles will be shown equipped for use in exploration, drilling and other off-road operations. Willys says that "the economy of operation and ruggedness of these vehicles, plus their ability to follow into 'impossible' situations, cut costs for their operators and enable them to increase the efficiency of their operations." Booth No. 619.

Introducing the "Pilot Bit"

Christensen Diamond Products Co.'s display will consist of three sections: (1) A selection of coring and non-coring bits showing bit designs and adaptations. Special feature will be a new long-nose pilot bit that actually cores ahead of circulating fluid. (2) An unusual collection of cores cut in the U.S. which will be of special interest to geologists. (3) Cutaway core barrels showing different features of double-tube, rigid, Series "D" mining barrels and 250-P oil field core barrels. Booth No. 1220

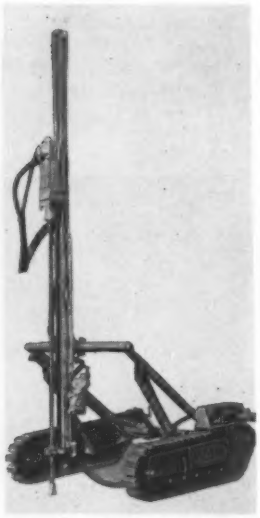
Boring Machine

Kwik-Mix Co., a division of Koehring Co., has announced the acquisition of Ka-Mo Tools, Inc. and will show one of the company's Ka-Mo boring machines at the Koehring booth. The machines have found world-wide use in sewer and tunnel, pipeline and utility applications, notes Koehring, and invites you to visit Booth No. 1323 and 1422.

Analyze Blasting Costs

Atlas Powder Co., Explosives Division has worked out a logical and practical method to analyze your blasting costs. Attendants at the booth will demonstrate how to use this new system. Write for or pick up the following packet to attack your blasting cost problem: "Blasting Cost Control Manual", "Blasting Cost Chart", "How to Use the Atlas Blasting Cost Chart." Also featured will be a movie of the record blast at Promontory Point, Utah, and the Armcaster switch for dependable firing of delays. Booth No. 1300.

Drills, Drills, Drills and Drills



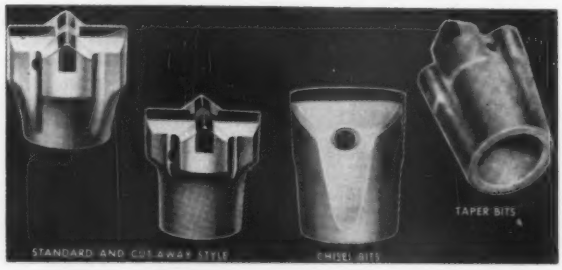
Joy Manufacturing Co. will demonstrate actual operation of "a new rock drill with a type of power never before used" in their outside booth area. In announcing this, the company says, "it is quite revolutionary and should be of interest to all mine operators." Also on demonstration will be a new Drill mobile mounting two drill-jibs for remote controlled drilling and a model No. 22 gasoline-driven diamond core drill. Inside the exhibit building many other recently introduced drilling products will be displayed, among which are: Joy's "in-the-hole" drill; model No. 25 14-hp air-operated diamond core and blasthole column-mounted drill; model TDL, a lighter weight Trac-Drill air-powered crawler-type drill-carriage with a "unique" self-leveling U-bar for mounting up to 4½-in. drifters; their air or electric crawler tractor which can be fitted with a drill jumbo attachment; airleg drills; a TM-600, 6-in. percussion blasthole drill; and Copperhead rock bits.

See outside Booth No. 736 and inside Booth No. 405.

Tungsten Carbide Bits

Western Rock Bit Mfg. Co. "A comprehensive display of Liddicoat bits which will feature both the Liddicoat single-pass steel bits in gage sizes from 1¼ in. to 3 in. and the companion line of the Liddicoat single pass Tee Cee bit which is the first tungsten carbide insert bit requiring no resharpening." Booth No. 315.

Kennametal Inc. will exhibit their complete line of tungsten carbide rock bits. They have a number of designs to fit particular ground conditions to give long life, fast drilling and low costs. Visit Booth No. 200.



Brunner & Lay Rock Bit of Philadelphia, Inc. Complete line of tungsten carbide "Rok-Bits" from 1¼-7 in. in dia will be on display. Four types are shown above. Request copy of the company's pamphlet, "Pneumatic Rock Drill Accessories," which contains a handy rock bit thread data chart listing 21 kinds of threads and tapers to be used for bits ranging from 1¼ in. to 5 in. in dia. Booth No. 1611.

Vascoloy-Ramet Corp. intends to display a complete line of carbide tip rock bits as well as introduce two new items—an 8-in. carbide tip percussion bit especially designed for burn-hole drilling; and a series of 3 or 4 diameters of push-on, chisel point detachable bits.

The 8-in. carbide tip percussion bit has a special pilot insert designed to break up the core and produce actual rock chips as opposed to the normal churn action commonly associated with large diameter rock bits, says the company. "Please drop in for a chat and a cup of coffee," they added. Booth No. 421.

Extensive Literature List

Atlas Copco Pacific, Inc. Literature is available on the following mining products to be emphasized at the show: Skid-mounted Type AR air compressors (leaflet E 890 B); new lightweight VT4 portable air compressor weighing only 2,310 lb (leaflet E 1092); Cobra motor drill weighing only 53 lb complete (leaflet E 941 A); Coromant extension steel and couplings for 1½-in. long holes (leaflet E 578); Sandvik Coromant detachable bits, 1½ in. to 2⅛ in. (leaflet E-573); heavy-duty portable grinder for mine shops (leaflet E 875); hard-metal bit grinder for hard-tipped steels (leaflet E 864 B); air-operated floodlight (leaflet TGB 41); light portable air hoists (leaflet 865 A); and the Tiger air-leg rock drill (leaflet E 1115). Booth No. 222.

Africa Mine Test Cases

Charles Abbott & Associates announces a new "Trueblast" rapid stemming plug which saves up to 33 1/3% in dynamite costs. It has been used extensively in South African and Rhodesian mines. Write to the company for case histories showing how the wooden plug performed in tests comparing the effectiveness of sand, wooden plugs and ceramic plugs as stemming material.

Movable Rotary Drill

George E. Failing Co. won't be at the Show, so write to the company for literature on Failing's new movable rotary drill rig—the Blast Master, designed to use both conventional type rock or drag bits, and even the new down-the-hole attachments. Extreme movability, faster penetration in hard rock areas, and easy positioning at drilling sites are stressed as features of the Blast Master. Unit is mounted on a GF-660 Crane Carrier truck with a GMC 4-71 diesel engine. Air compressor is a Le Roi Model 100-S2, and is powered by a GMC 6031-C diesel engine.

Low Cost Blasting

Spencer Chemical Co.—latest developments and techniques for the use of its prilled ammonium nitrate as the basic ingredient of low-cost field-compounded blasting agents.

Spencer feels that the strong points of the prilled ammonium nitrate are safety, simplicity of loading, and high efficiency. Booth No. 1112.

Hercules Powder Co. will present Dynatex—a new improved, low-cost ready-to-use blasting agent at AMC. Dynatex is a nitro carbo nitrate and is the newest addition to the company line. It is available in a variety of packings, eliminating the mixing of blasting ingredients on the job. Other Hercules blasting agents will be on hand, along with the men who can tell you all about them, at Booth No. 1345.

History-Making Blast; New Aids

E. I. DuPont de Nemours & Co., Inc.'s Explosives Division will exhibit a film on the history-making Ripple Rock shot, and the products that made this project possible. In particular, Nitramex 2H, a high-density blasting agent, will be on display. DuPont's booklet, "The Way duPont Makes Electric Blasting Caps," will be distributed at the booth. Blasting caps are assembled on an automatic assembly and testing line. Write for literature; also ask for details on Nilite, Nilite WR and Nitramite FR which will not be exhibited at the AMC Show.

DuPont's Blasters' Handbook, sesquicentennial edition, has recently been translated into Spanish by Cia. Mexicana de Explosivos, S.A., Av. Juarez 117, Mexico 1, D. F., and sells for $2.40 in Mexico and $3.00 elsewhere. It will not be available at Booth No. 1210.

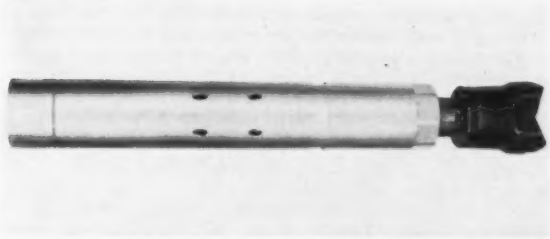
Coast Mfg. & Supply Co. will pictorially show how detonating fuse (Primacord) and igniter cord (Spittercord) are used on current blasting operations. Both products represent methods of initiating blasts free of normal electrical hazards, but at the same time retaining operating effectiveness and simplicity. Booth No. 1706.

Explosives Division, Olin-Mathieson Chemical Corp., will have on display their dynamite and blasting caps at Booth No. 1531 and 1529.

Drill Bits and Inserts

Firth Sterling, Inc. will be there with their line of mining machine bits, roof bits, drill and finger bits, inserts, percussion rock bit inserts, carbide cutting tools, tips, inserts and high speed steel production tools. Write to Firth Sterling for literature (M57) on Firthite mining tools. American Mining Congress Booth No. 1411.

For Faster Drilling



Gardner-Denver Co. plans to display the Mole-Dril—a down-the-hole attachment that fits any rotary air-flush blasthole drill in the 4¾ and 6½ in. dia sizes. Drill will cut with unusual speed in the hardest formation or even broken ground. All the energy is exerted down the hole directly on the tungsten carbide bit (short shank). Drilling depth is limited only by the air capacity needed to clean the hole. Also on display will be Gardner-Denver's line of stopers, drifters, swing-boom Air-Trac drill units, carloaders, slushers, air hoists, air compressors, bit and steel grinders, steel, sump pumps, impact wrenches, sinker drills and air feed-leg drills. Company will expect you at Booth No. 231.

Improved Impact Breaking

Iowa Manufacturing Co. will display, for the first time, the new Cedarapids Single Impeller Impact Breaker, which with the Double Impeller Impact Breaker causes such a high percentage of material to be broken in suspension that there is up to 50% less contact of stone on metal, the company says. The Double Impeller will be diagrammed at the booth to emphasize its low maintenance and low power consumption characteristics. The Cedarapids horizontal vibrating screen will also be on view, handling and screening a product right at the scene at Booth No. 744.

Dependable Rock Bits

Timken Roller Bearing Co. will present its tapered roller bearings, removable rock bits, and alloy steel used in the metal mining industry, and will stress "the economy, dependability, and long life of Timken all-steel, multi-use and carbide-insert rock bits."

The company will also show a cutaway Timken-bearing-equipped mine car wheel, a cutaway heavy-duty type AP freight car bearing application, a conveyor tube assembly and several other mine car parts. Booth No. 1530.

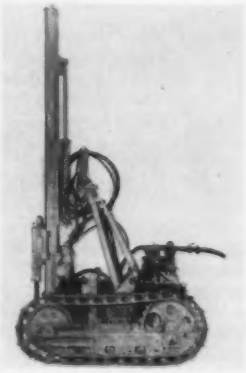
New Shot Firing Wire

Plastic Wire & Cable Corp., Jewett City, Conn., will exhibit a new type of shot firing wire which, the company says, has demonstrated "extraordinary re-usable life under very severe mining conditions." Booth No. 1125.

Greater Depth—Lower Cost

Reich Bros. Mfg. Co., Inc., whose drills "increase penetration and lower drilling and maintenance costs through exclusive engineering advancements such as 'original top hydraulic drive', 'complete control with easy operation', 'down-the-hole-drilling' and through built-in strength and durability," will feature Reich combination rotary and down-the-hole drills. Booth No. 730.

Deep Hole Drill on Tracks



Chicago Pneumatic Tool Co. will feature the G-800 crawler-mounted "Tracdril" with a 4½-in. deep hole drill and a CP-600 rotary compressor. See illustration. The unit will be supported on jacks to show the operation and deadman control of the tracks. Hydraulic controls assure fast and accurate drill positioning. Also shown will be a new CP-65 air-operated diamond drill, sinker drills, demolition tools, pumps, hoists, stopers, impact wrenches and sinker airleg units. Booth No. 740.

To Simplify Your Blasting

American Cyanamid Co. The company's national service story of years of explosives experience will be dramatized by an electrically-lighted map showing locations of plants, sales offices and magazines. Products to be featured will include Accomite, Cyadyn and regular powders. These are representative of the company's complete line of permissibles and high explosives for open-pit and underground mining. American electric blasting caps and blasting aids and accessories will also be shown. Booth No. 1415.

Cyanamid's explosives and mining chemicals department has issued new brand names for similar grades and types of high explosives to make company products easier to identify.

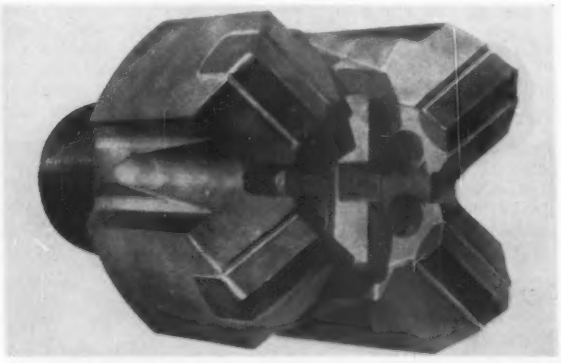
New Cyanamid brand names	Former Illinois brand names	Former American brand names
Straight Gelatin	N. G. Gelatin	Straight Gelatin
Powertol	Powertol	Amex
Ajax	Ajax	Semi Gelatin
Cyamite	Gomex	Cyamite
Cya-Gel-Pak	Pliogel	Cya-Gel-Pak
CX Dynamites	G.L. Dynamites	CX Dynamites

Less Drill Downtime

LeRoi Division, Westinghouse Air Brake Co., will have new jackleg, stoper and sinker drills on display along with rock bits. As the company says, these products increase drilling production through better designed equipment leading to less downtime for maintenance, easier operator performance and faster drilling—saving time and money. Visit Booth No. 121.

Study the New Bit Types

Hughes Tool Co. will give an inside look at a Tri-Cone rotary rock bit, ball and roller bearing, bearing races, etc. in their display of air-rotary blasthole drilling equipment. Also on display will be drilled rock, a model of the Hugheset Aero-Jet Tri-Cone and other late designs of the Aero and Aero-Jet bits. Booth No. 930.

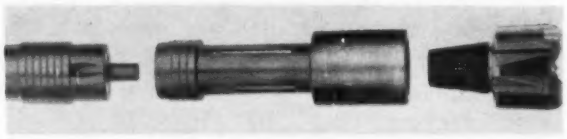


Mission Mfg. Co. Stop by at their booth and take a look at the special bit design shown above—its designed to go with Mission's down-the-hole Hammerdril. Bit is X design with a central chisel which eliminates the extreme pulverization of central material that occurs with ordinary X-bits and cross bits. Bit can be resharpened in the field. Bit sizes available for the 3⅞-in. Hammerdril are 4½ and 4¾ in.; and for the 5¼-in. tool, the bit sizes are 6, 6½ and 6⅝ in. Booth No. 212.

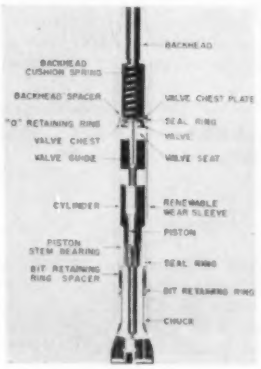
Varel Mfg. Co. will show the 15/16 in. rotary and eight bit formation types including the new VHl, hardest tooth-type bits, for drilling pyrites, hard limes and quartzite.

Varel Diamond Products Co. will present the Star diamond bits—claimed to have better penetration rate, freer cutting, less hole deviation, and no swabbing action due to generous junk slots.

New Down-the-Hole Drill; Design Change



Mission Mfg. Co., well known for their line of well drilling pumps and equipment, recently introduced a down-the-hole drill (shown here) called the Hammerdril, and available in two models (100 and 250 psi air pressures). Depending on air pressure and model, the machine can be adjusted to operate at from 500 to 6000 strokes a minute. Attachment can be used on any standard rotary rig. Drill stem sizes for both models are 3⅞ and 5¼ in. O.D. See it at Booth No. 212.



Ingersoll-Rand Co. announced a design change in the Depthmaster down-the-hole drill which provides continuous hole cleaning air even when the drill is not operating. Depthmaster is available in three sizes for 4¾ to 7 in. blastholes. Booth No. 522, 526 and 532.

Feeding the Ore

Ross Screen & Feeder Co., Westfield, N. J. has a most interesting story to tell of the company's services and products for handling of ores. Stars of the presentation, along with examples of full-scale engineering projects, are the famous Ross feeders and grizzlies. Their latest catalog describes, with characteristics, the Ross chain feeder, the drop bar feeder, the two-roll grizzly and the non-choke bar grizzly, and the Ross roll barriers. You'll be particularly interested in the famed chain feeder and the "roll-vibro" action of the two-roll grizzly. Catalog C.

Battery-Driven Truck

Gould-National Batteries, Inc. has a battery-driven underground ore truck that will be of interest to you. Stop by the booth and ask about it. A complete line of mine batteries will be shown at the booth. If you've got battery problems or applications, Gould-National's engineers will be glad to talk about them. Booth No. 326.

New Belting Information

Extremultus, Inc. says that literature is available on their line of belting which can reduce belting costs by as much as 50% on all applications.

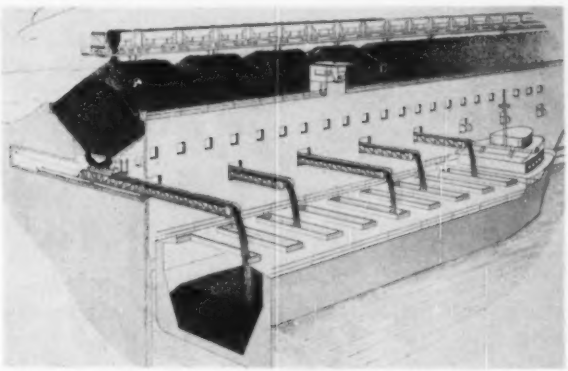
Goodrich Industrial Products Co., B. F. Large sample pieces and a wide variety of belting, hose, chute linings, work clothing, Koroseal pipe and fittings, rubber tubes for flotation machines and other rubber products.

Lightness, flexibility, easy handling, strength and durability are a few of the strong points of B. F. Goodrich hose, according to company officials. They go on to say that the firm's conveyor belts have greater abrasion resistance, greater carrying capacity, and that the longer belts can be used with fewer transfer points. Booth No. 626.

Easy Pump Maintenance

A. R. Wilfley & Sons, Inc. is introducing a new 10 in. slurry pump which will be available with a variety of abrasion-resistant alloys and interchangeable, soft rubber covered wear parts. According to company announcements, the pump will have continuous trouble-free operation without attention, low maintenance costs through simplified design, maintained high efficiency throughout the life of long-wearing parts, rugged construction, and easy replacement of parts.

Model Ship Loader



Link Belt Co. is taking justifiable pride in the conveyor system now operating at one of the nation's leading taconite operations. The conveyor and ore boat loading booms, built into a 1200-ft long reinforced concrete dock, represent the latest word in automated materials handling. Taconite pellets are discharged into bins, fed onto belts and then into the open hatches of ore boats with smooth, efficient and exact technique. Two boats can be loaded simultaneously at the dock, with several hatches being filled at the same time and with the pellets distributed evenly and exactly along the bottoms and weighed in transit. More information can be obtained directly from the company. Booth No. 311.

Fast Working Side Dump Car

Baldwin-Lima-Hamilton Corp. will have an operational model of the "Western" air-operated side dump car. B-L-H claims that it dumps easier and faster because of dual side pivots, and that, due to lightweight alloy steel (minimum deadweight), extra payload is possible. In addition, "less maintenance and longer life results from the welded bed underframe, double plate doors and rugged construction." Booth No. 225.

New Design Dump Trailer

Athey Products Corp. is showing its PW20 bottom dump trailer which, as stated in a company release, has the following advantages: (1) It's made entirely of a new steel (T-1) that eliminates "dead weight" and greatly improves trailer's weight-to-capacity ratio; (2) it has a rear door that opens simultaneously with the bottom doors and permits material to flow smoothly to the rear; (3) rear axle clearance is high enough to allow the trailer to ride out over—not through—the dumped load; and (4) air release opens the doors instantly for controlled dumps. Booth No. 825, 831 and 837.

Getting Ore From Here to There

White Motor Co. is going to drive an Autocar Model AP-25—a 25-ton off-highway rear dumper—right into the arena. Of course, they'll have to take off the rock-body shell and the 16-cu-yd scoop to get it in; but that'll give you a chance to get a closer look at the rest of the unit with its 335 hp diesel engine torque converter, direct drive lock-up, 4-speed planetary transmission and Torqmatic brakes. Booth No. 843.

Koehring Div., Koehring Co., will display the Model 60 Dumptor, a 6-cu-yd capacity off-highway hauling unit designed to handle rock, ore, waste and dirt. Koehring notes that the unit's instant gravity dump provides low cost, high output performance and works best on no-turn shuttle hauls. Speeds on the machine, which can be either gasoline or diesel powered, range up to 17 mph in either direction. Booth No. 1323 and 1422.

KW-Dart Truck Co. has a story in four parts for presentation at the Show. Part I is the Model 50T, a 50-ton tandem end dump truck, powered by a 12-cylinder Cummins diesel, equipped with semi-automatic transmission converter, triple reduction planetary rear axles. Part II makes its debut at the AMC Show, a tractor and trailer earthmover (Model 803B) with a payload capacity of 128,000 lb. Borg-Warner transmission, Cummins 12-cylinder, turbocharged 600-hp engine, is one of the largest earthmovers in industry history, the company believes.

Part III is a small, dieselized underground haulage unit, fully equipped with scrubbers. Part IV is the Borg-Warner 4-speed transmission converter unit, to be shown in a cutaway view and working model layout. For students of haulage history, KW-Dart will also show a 1903 model of one of its earliest units, an antique in perfect operating condition. You'll enjoy the presentation and pick up some valuable information at Booth No. 810 and 811.

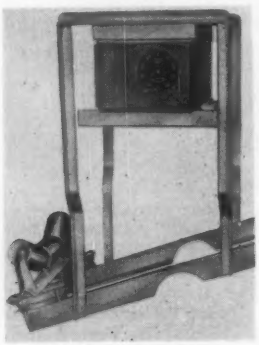
Reducing Conveyor Spillage

Hewitt-Robins, Inc. will set up shop at the Show with the main feature being a 20-ft section of the new Hewitt-Robins Rope Stringer belt conveyor shown above. Conveyor can be erected easily, and handles high capacity with less spillage than conventional conveyors. Also exhibited will be Style E-9, 48x96-in. heavy-duty feeders, a speed reducer, infra-red car thawers, bin-level controls and the company's line of screen cloth, rubber hose and conveyor belts. Booth 422, 426 and 432.

Jeffrey Manufacturing Co. will feature a 30-in. wide rope belt conveyor which is especially easy to install and extend. Instead of rigid structural members, two parallel wire ropes are used to suspend the load carrying idler assemblies. The return idlers are built into the "H"-shaped standards that support the ropes. According to the maker, in many cases, the rope belt will cut initial and installation purchase cost of about one-third that of a rigid type conveyor of comparable size. The cost of intermediate sections is about one-half to three-quarters. The ability to advance or retreat rapidly is the conveyor's outstanding contribution to efficient mine operation and subsequently greater profits.

A Rock Buster crusher will also be exhibited in their three booths—No. 321, 325 and 331.

Versatile Belt Scale



Thayer Scale & Engineering Corp.—"Our new product of interest to mining operations is our model T18 continuous belt scale which can be supplied for either electrical or air operation. It is mounted on any size troughed or flat conveyor, either horizontal or angular rise, to continuously measure, indicate the momentary rate, and totalize amount of product handled, with a high degree of accuracy."

Unique Belt Construction

Boston Woven Hose & Rubber Co. Balanced conveyor belt construction, an exclusive method of belt manufacture, will be stressed at the booth. Electro-tensile control is used to equalize ply tension electronically, and "Rotocure", a continuous vulcanization method of manufacture, is used to assure belt uniformity.

Pick up or write for Form No. 1210-R358 which shows advantages of this new technique of making conveyor belts. Also featured will be Boston's V-belts which combine Dacron tensile members and Neoprene with fiber-dispersed stock in the compression member. Booth No. 1630.

Separate-Drive Tractor

Euclid Division, General Motors Corp. A TC-12, Twin-Power crawler tractor will be shown. TC-12 has two parallel 218hp engines with separate Torqmatic drive for each track. Booth No. 714, 720, 815, 820 and 821.

Bigger Payload on Wheels

LeTourneau-Westinghouse Co. will introduce the LW-27 Hydrair truck. This is one of three off-road rear-dumps from 22 to 32 tons that are being field tested by LeT-WesCo. Among the features of the LW truck line is a "unique" suspension system which makes possible greater tonnage on short wheel base, yet maintains a lower center of gravity than conventional trucks. A color-sound film will show the entire line in field operations—including the LW-80, an 80-ton bottom dump trailing coal hauler for the Hydrair prime mover. See it at Booth No. 540.

Euclid Div., General Motors Corp., will also display the R-27 Rear Dump with 27-ton payload. Unit has Torqmatic drive with four speed ranges and converter lock-up for maximum power and fuel economy. Booth No. 714, 720, 815, 820 and 821.

Heavy Duty Conveying

Barber-Green Co. will throw light on heavy duty belt conveyor carriers and on the details of its Duo-Screen.

According to the company, "heavy duty carriers marks another step in Barber-Greene progress into extremely heavy, wide belt conveyor field for ore handling. Duo-Screen promises new efficiency in handling wet, sticky and other hard-to-screen bulk materials." Booth No. 211.

New Loading Principle

Eimco Corp. is introducing a new "continuous rock loading machine" at the Show. The model to be introduced has a capacity of four tons per minute and is, Eimco says, one of a line of loaders with capacities up to 15 tons per minute which incorporate a new loading head and a new loading principle which permits operation in confined areas with low headroom. The company also notes that the machine can be used in potash, coal, sand and gravel as well as in rock. Other features of the booth will cover the company's complete line of front end loaders, bulldozers, tractors, etc. Booth No. 125.

Long Haul Conveyors

Link-Belt Co. will have an exhibit showing an extensive conveying system recently installed at a copper pit for loading cars on the surface. Belt conveyor idlers and allied material handling products will be displayed too. See Booth No. 311.

Super Breaking in the Pit

Caterpillar Tractor Co. will have one of the largest exhibits it has had in some time. Center of the display will be a Caterpillar D9 tractor with No. 9 Ripper shown above. It has aroused interest in mining circles as an efficient unit for breaking hard materials without blasting. The 300-hp machine can exert more than 54,000 lb of pull on the ripper teeth. Also on display will be the 191-hp Cat D8 tractor with a No. 8S bulldozer and hydraulic tilt cylinder which increases efficiency on hillside grading and ditch cutting. A No. 933 Traxcavator with a side-dumping bucket will be demonstrated. This unit with 1⅛ cu yd bucket cuts hauling time by eliminating turns. The DW20 wheel tractor and new Athey PW20 bottom-dump wagon to be on display is capable of moving a 40-ton payload at speeds up to 35 mph, and dumping in continuous windrow without stopping. Booth No. 825, 831 and 837.

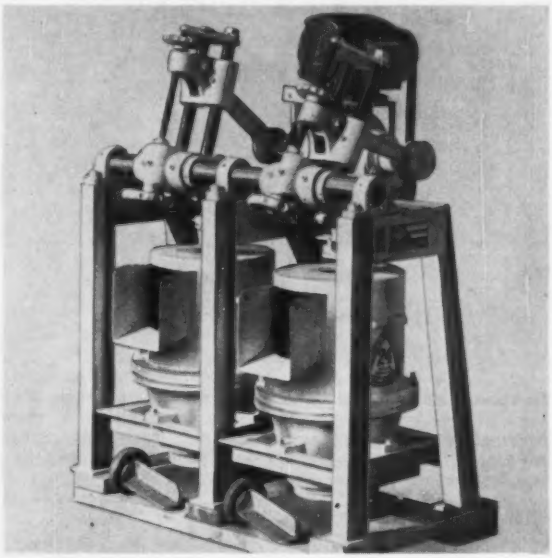
Braking the Big Ones

B. F. Goodrich Co., Aviation Products Div. will supply you with all available information on the recently introduced B. F. Goodrich Hi-Torque brakes for off-the-road equipment. Quicker stops, safer operation and lower maintenance costs are noted as advantages by the company.

A Model of a Modern Mine

C. S. Card Iron Works Co. Visitors to the 1956 Equipment Show will recall the fully automatic ore-handling system in a cross section mock-up of a mine where chutes measured and fed ore cars which were automatically shifted, spotted and dumped. A skip-loading mechanism fed individual skips which were hoisted to the surface and dumped. The company's booth this year will carry a similar display featuring mine cars, skips, loading equipment and other auxiliary items related to muck handling. Literature on the complete line of mine cars and other equipment will be available. Booth No. 1106.

1,000 gpm Pumping, Varied Capacity



Denver Equipment Co. will feature the world's largest adjustable-stroke diaphragm pump—1,000 gpm capacity. Model E Denver pump, available in sizes from 1-in. simplex to 10-in. duplex. Capacity can be varied while the pump is running, by turning a handwheel which changes the length of pumping stroke. Duplex Model E (4-in.) will deliver 140 gpm at maximum stroke, yet requires only 1 hp (photo above). Booth No. 515.

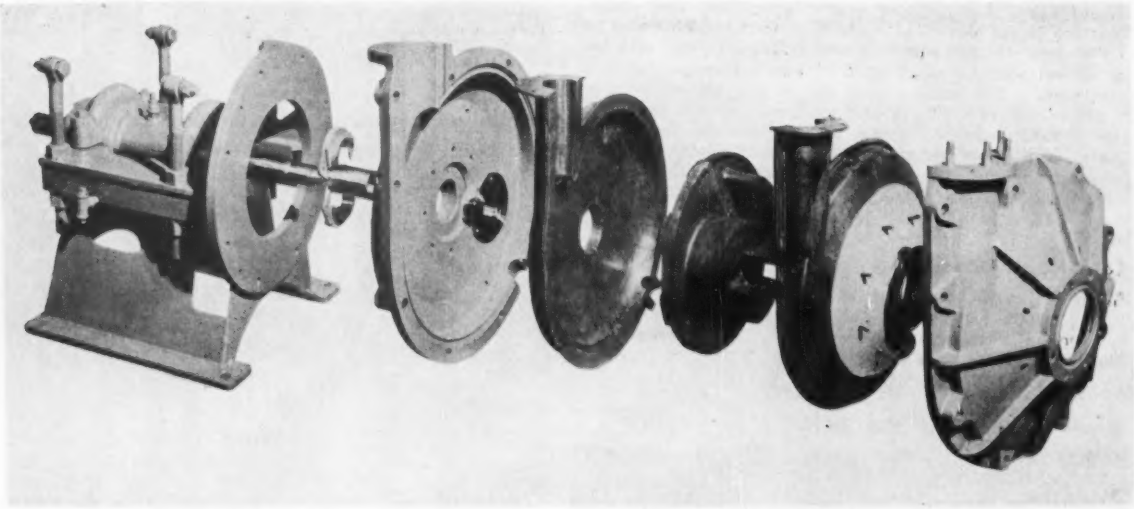
B&B Hospitality

Broderick & Bascom Rope Co., manufacturers of wire rope for every mining use, will sponsor an entertainment booth this year. Booth No. 1419.

Bowl Scraper Bulletins

Euclid Div., General Motors Corp., plans to display the TS-24 Twin-Power bowl scraper, wheeled, as part of their earthmoving line. According to 23-page TS-24 bulletin (554), the TS-24 has a four-wheel tractor and pusher with a total of 518hp, a struck capacity of 24 cu yd, separate Torqmatic drives and hydraulic control. Booth No. 714, 720, 815, 820, and 821 for the complete Euclid line.

To Move a Slurry



Galigher Co., manufacturer of the Vacseal line of replaceable-liner slurry pumps shown above in exploded view, will show a complete line of these pumps at AMC. Also included will be Agitair flotation machines, Geary Jennings samplers, Galigher acid-proof sump pumps, and one product to be introduced at the Show—an all-new plastic sump pump engineered for a corrosive application with emphasis on maximum parts life and minimum maintenance. Booth No. 1600.

Loader-Transporter, Slusher

Joy Manufacturing Co. will display many mining products in their outside and inside booths. For muck handling, their air or electric-driven crawler-tractor will be shown inside with the overcast loader and dozer blade attachments. This versatile unit can be equipped with overcast buckets from 5 to 11½ cu ft. A hopper up to 33 cu ft capacity can be added to make an effective short-haul transporter. It can also be outfitted as front-end loader, backhoe, timber-setter, fork-lift or drill-jumbo.

Another muckhandling unit to be shown is the C2F-211A double drum slusher. Although it is the size of a medium capacity unit, it handles large capacity scraping jobs with a 50, 60 or 75-hp ac motor. Although not to be exhibited, Joy's Limberope belt conveyor deserves mention with its flexible idlers suspended between two wire ropes. It is quickly set up or extended. Optional chain-type support stands permit easy height alignment. New scraper sheaves will also be shown.

Visit Booth No. 405 inside and 736 outside.

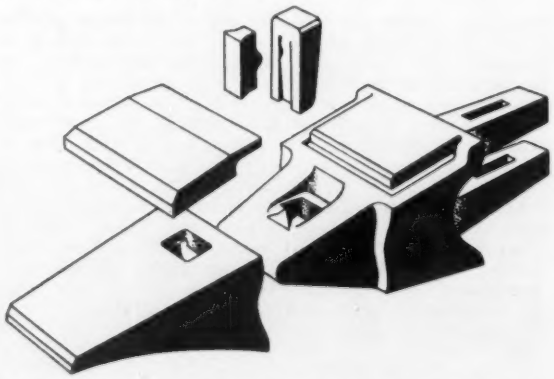
To Move the Earth

Allis-Chalmers Mfg. Co., Tractor Group. Nearly 7,000 sq ft of floor space will be used to display A-C's broad line of earthmoving equipment, including the TW-360 motor wagon, a TS-360 motor scraper, and HD-21 diesel-powered turbocharged crawler tractor with dozer and ripper, a stripped-down model with cutaways of parts of an HD-21 crawler tractor, an HD-16 diesel-powered crawler tractor with torque-converter drive, a Model 45 motor grader, two tractor shovels, the Model D-516 diesel power unit, the D-844 fan-to-flywheel engine, the W-226 gasoline power unit, and a 100-kw generator set. Booth No. 130, 140 and 240.

35 Years of Haulage

Stephens-Adamson Mfg. Co. will feature a birthday party and cake with 35 candles to mark the age of the first anti-friction carrier, one of the major developments that made long distance conveying possible. The guest of honor "himself" is expected to be on hand from the Frick Coke Co. after handling 100-million tons of coal. Other mining equipment will also be shown, as well as a photographic tour of S-A's iron ore handling installation at Seven Islands, Que. You're invited to the party at Booth No. 1322.

When to Replace Teeth



American Manganese Steel Division, American Brake Shoe Co. A large working model of the two-part "Simplex" dipper tooth shown above will be on display. Pick up or write for a copy of "The Amsco Simplex," which cites case histories of dipper-tooth life under various digging conditions. Eight other types of digging teeth will also be shown. Booth No. 215.

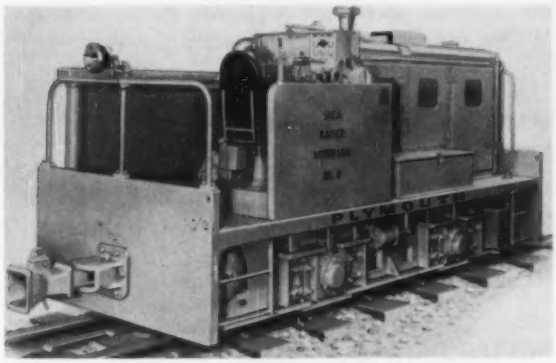
New Jig, Model Dredge

Yuba Consolidated Industries presentation will contain a working model of a bucket ladder dredge, a "Movall' earth and rock mover and their new type jig metal concentrator.

Yuba reports that "new improved 'jigs' have side diaphram for easy metal recovery and many other innovations which insure more complete recovery of a variety of metals and stones." Booth No. 733 and 737.

Workhorses of the Drift

Mancha Storage Battery Locomotive Div., Goodman Mfg. Co. will feature their 2-ton diesel locomotive with USBM approval plate, 1½-ton storage battery locomotive and a section of Ropebelt conveyor. Their locomotives, Mancha mentions, provide dependable, low-cost haulage. The Ropebelt is applicable to long or short hauls and is easy to install, has low initial and maintenance costs. See Booth No. 1423 and 1427.



Plymouth Locomotive Works Div., Fate-Root-Heath Co. will not be present at AMC. Latest addition to their locomotive line has been the diesel-powered 5-25-ton Mine-O-Motive mining and tunnel locomotives fitted with exhaust scrubbers and suitable for underground use (approved under U.S. Bureau of Mines Schedules No. 22 and 24). Unit features greater economy and safer operation. They are available with chain or shaft drive, torque-converters and full power shift transmissions. Write for details.

Conveying With Low Maintenance

Manhattan Rubber Div., Raybestos-Manhattan, Inc., will feature its Poly-V Drive plus synthetic fiber conveyor belts that will, according to Raybestos, "withstand impact better, trough and train better, and last longer." The company will also display new hose improvements and its general line of industrial rubber products.

The Poly-V Drive consists of a new type belt with specially designed pulleys to mate with the ribs in the belt, which combines the simplicity of a flat belt and the grip of a "V" variety. Raybestos claims that it eliminates matching, has greater strength, maintains constant pitch diameter and speed ratios, and saves space. Booth No. 1418.

A New Earthmover Series

John Deere introduced several earthmovers in 1958, among which are the 440 Series industrial tractor (crawler and wheel) and the 440 Series crawler-loader displayed above. Crawler-loader is a 7/8 cu yd machine with a 7 ft 10 in. maximum dumping height to the lip of dropped bucket. Available with gasoline engine in four- or five-speed transmission. John Deere also makes the Hancock-John Deere tractor-scraper in 5 and 11 cu yd capacities. Scraper uses an elevator to load the bowl.

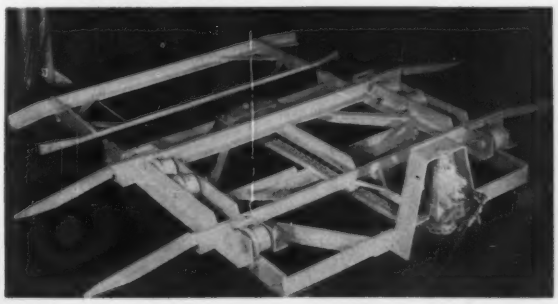
Improved Digging Design

J. I. Case Co. has introduced a new four-wheel drive, rear-wheel steer tractor-loader, the "W-9 Terraloader" shown above. The unit may be used with three interchangeable buckets ranging from 1⅜ to 1¾ cu yd depending on weight and type of material to be handled. Forward reach of the loader at 7-ft dump height is 62½ in. Rear wheels carry 40% more weight than front wheels to improve digging and carrying performance. Also new is the tractor-mounted "Terra Trac Model 1000" unit which in one instance has loaded as much as 3,000 cu yd of material into trucks per day. Write to J. I. Case Co. for useful descriptive and engineering data on these new models.

Modern Power Steering

Skookum Co., Inc. announced that their AMC booth would have their complete line of slusher mining and utility blocks on hand. New item to be introduced at the show is a hydraulic power steering system for crawler tractors that eliminates slipping of the steering clutches. Increased service life, less maintenance, easier steering and increased operator efficiency are noted as advantages. Booth No. 1227.

To Cut Car Haulage Time



American Mine Door Co. Two new products, never shown before, will be demonstrated: (1) An air-powered mine-car transfer, shown above; and (2) an air-powered switch thrower. The car transfer cuts dead time on car change in the loading cycle, and the switch thrower speeds haulage and prevents injuries to personnel. Write or ask for brochure, "Easy Does It," which illustrates the car transfer. Booth No. 625.

Scraper Applications

Alloy Steel & Metals Co. Mining equipment on exhibit will include the Pacific Slushmaster scraper, Pacific sheave blocks, Pacific manganese steel mine-car wheels. A large back-drop will show how Pacific scrapers are used in underground mining operations. Booth No. 412.

From "Top to Bottom"

Connellsville Manufacturing & Mine Supply Co. A complete line of shaft muck-handling equipment from "top to bottom" will be stressed. Equipment includes sheaves, cars, rotary dumps, trip feeders, skip loaders, bottom-dump skips, elevator-type circular cages, automatic hoists (friction-drive type) and other items to modernize shaft installations. Booth No. 950.

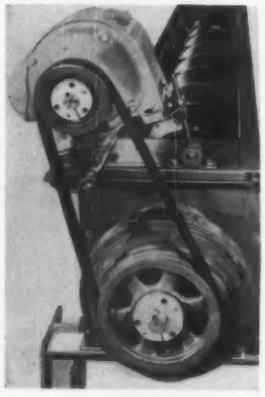
Bigger Diggers

Northwest Engineering Company will display photographs of their line of shovels, cranes and draglines in Booth No. 1625.

Bucyrus-Erie Co. has a problem, but they happily have an answer, too. Let's face it, if they brought a 150-B shovel to the AMC Show, they might have a little trouble getting it through the door. So, there's an exciting model of the 150B (1-in. to 1-ft) set up for Booth No. 1610. The machine bites, crowds, lifts and dumps just like its prototype, and always draws a crowd. This year, if we get nerve enough, we're gonna' ask if we can run it. Just slip through the crowd of model fans and get a good closeup view of the performance at Booth No. 1610.

Marion Power Shovel Co.'s exhibit will feature an animated and photo display of various shovels ranging from 6 to 60 cubic yd dipper capacity. Marion lays claim to the largest shovel on two crawlers—the 191-M, a 10 cu yd digger. Their 5760 is the mons'er 70-yd coal stripper. Other models are adaptable to dragline work, some with walking shoes. Their air controls retain the feel but not the the strenuous effort of older controls. See Booth No. 205.

Screw Conveyor Drive



American Pulley Co.'s recent new-product announcements include the Screw-King conveyor drive, shown here, and an American Conveyor pulley with a new end disk that permits transportation of heavier loads. Useful engineering data are included in the following bulletins offered by the company: Catalog SCD-58 describing the Screw-King Drives, and Catalog CP-57 on the company's line of conveyor pulleys.

Couplings With "Give"

Charles E. Manning Co. will display Alumiron grooved-type couplings and fittings. Feature will be their Swing-bolt coupling for light-walled pipe. Made of malleable iron or aluminum, these fittings are designed for leak-proof, lock-tight joints in grooved-end pipe of all kinds. This method of coupling pipe is faster from a labor standpoint and far more economical from a material cost viewpoint, according to the maker. The couplings permit slight misalignment to follow ground and are ideal for use where vibration and line sag are evident and where quick disassembly and reinstallation is advantageous. They can be used for water, air, chemical, and other lines. See Booth No. 1100.

Hoists—Large and Small

Nordberg Mfg. Co. Working models, photographs and movies will show design features inherent in Nordberg drum and friction type mine hoists, and crushing and screening plants for mine use. Booth No. 1523 and 1527.

Vulcan Iron Works Co. (Denver). "Our chief exhibit item will be an operating model of a semi-automat'c service hoist. This unit was designed to put the price of automatic hoisting within the range of the small operator. At one installation, four men were released for other duty while the price of the unit was less than the annual wage of three men." Booth No. 1614.

Beating Low Headroom

Ortruc, Inc.'s two workhorses, the 6- and 10-ton underground diesel trucks (Oremaster and Ortruc), are scheduled to share top billing at Ortruc's booth.

The Oremaster's main advantage in underground hauling is its reduced height. Ortruc says that "it was developed to permit the operator of trackless haulers to use rubber tired equipment in low headroom and narrow drift areas. If your drifts are 8x8 ft, you can use the Oremaster (see photo) and have room to spare."

The Ortruc (10 ton hauler) provides a 50 deg dumping angle which, the company claims, will guarantee the speedy unloading of even the wettest muck. The hauler's dump bed design they say "lends itself ideally to ram type loading—and body capacity is a full 10 tons with a partially heaped load. Over all height is 7 ft."

Tubing, Transmission, Tools

Hamilton Rubber Mfg. Co. says that their complete line of materials handling equipment, power transmission units, fire-fighting tools, hose lining, packing and mine ventilation tubing will be presented at AMC. Check Booth No. 1704.

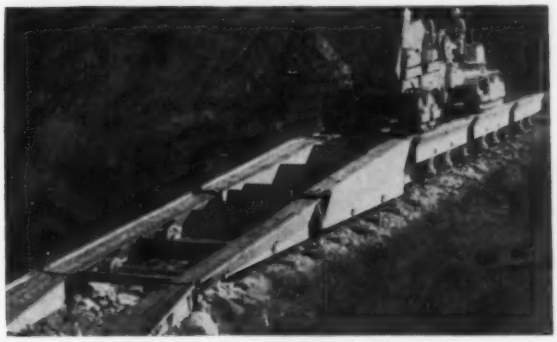
Heavy Duty Torque Converter

National Supply Co.'s booth will contain a heavy duty industrial torque converter which is used on large mining and earthmoving equipment in the 100 to 1000 hp classification. Viewers will get an inside look at the principal converter elements—blading is exposed to allow a cross-sectioned study of the entire unit. Booth No. 1231.

Big Shovel Control

Harnischfegor Corp. will show Magnetorque frictionless swingers and electronic control cabinets. Machines to be covered range from 3½ to 10 cubic yd. Frank Hirner, sales manager, electric shovels, and Jack Catalane, general sales manager, will be in charge of the company's exhibit. Booth No. 1410-1414-1315.

Trackless Gismo Mining



Sanford Day Iron Works, Inc.'s Gismo, the self-loading transport, will be that company's star attraction at the Mining Congress. This year's exhibited Gismo will have rubber tires. In addition, the S&D drop-bottom ramp cars will share a bit of the spotlight. Sanford Day states that the Gismo equipment can produce greater tons per man at less cost with less capital investment for given tonnage. The ramp cars are used in connection with sublevel drifting and will produce low cost development. Booth No. 840.

Slurry Pump Specifics

Barrett Haentjens & Co. Booth attendants will supply you with information on the company's line of vertical and horizontal slurry pumps for the mineral processing industry. Booth No. 1310.

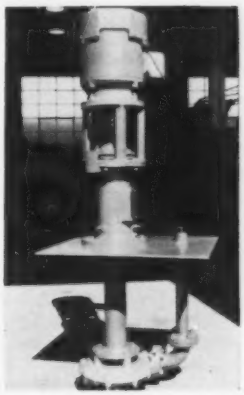
Allen-Sherman-Hoff Pump Co. Here you will see the Frame D-6-5 rubber-lined slurry pump with split-shell construction. This addition to the company's line is one of the world's largest pumps with replaceable rubber linings. Contact booth attendants for cost-cutting and efficiency performance data on this pump. Booth No. 1615.

Building a Power Train

Clark Equipment Co., Construction Machinery Division, will emphasize its unified line of tractor shovels, tractor dozers, and tractors which offer an unusual degree of power train component interchangeability. Items on display will be a 6-cubic yd "Michigan" Model 375A tractor shovel; a 335-hp Model 380 tractor dozer, and a 162-hp new Model 110 rear-dump unit. A train of Michigan rubber-tired earthmoving units is shown above. Mechanical features include power-shift transmission, torque converters and hydraulic controls designed to boost tons-per-man output. Booth No. 500, 600 and 601.

Pumps Made to Take a Beating

Nagle Pumps, Inc. booth will emphasize units for abusive applications in ore preparation plants. "We will show operating pumps for handling both abrasive and corrosive liquids. One of these will be our Type CWO vertical, cantilever-shaft unit which has no stuffing box or submerged bearing (see photo at right). Type HA automatic priming unit and Type KR horizontal shaft model will also be shown. In addition, a slide projector will show important installations," says the company. Booth No. 221.



Softening the Wallop

National Malleable & Steel Casting Co. will demonstrate how the use of National rubber cushioning devices reduce stresses and strains in mine car structures. The cushioning devices are used as buffers between cars or as load carrying springs on car trucks. Other items on display will include the Willison automatic coupler, the latest railroad type F coupler which has been adapted to large capacity cars for strip and open pit mines, as well as miscellaneous castings for the mining industry that are made by the Capitol Division at Phoenix.

Easy Handling of Air

Bemis Bro. Bag Co. Safety yellow Nyprene Flexipipe ventilation tubing used to direct an adequate supply of fresh air to wherever it is needed in underground mines and tunnels is the main feature of the Bemis display. They'll also demonstrate explosive bags.

The Flexipipe saves labor costs because one man can install 100 ft length in a fraction of the time required of several men for the same amount of rigid pipe. Booth No. 1712.

USBM-Approved Trammer

National Mine Service Co. now has a diesel-powered model of their mine-proven shuttle car. The 15 to 18 ton capacity trammer is called the TorKar and is based on the principle of a single prime mover design whether ac, dc or diesel. Such a principle of design simplifies construction, operation and maintenance. It employs a hydraulic torque converter, has power steering and is fitted with the patented National Mine exhaust gas conditioner. USBM has approved it on Schedule 24.

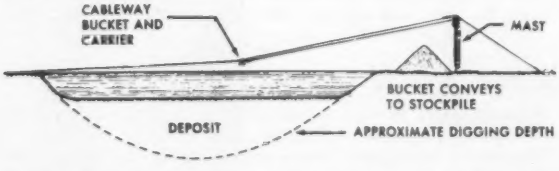
For Heavy Hauling

Mack Trucks, Inc. has built its exhibit around the double-barrelled appeal of the company's two entries in the major divisions of mining haulage. The LVX, a 22½-tonner, is an off-highway vehicle, dedicated to use in large open pits. It features a Borg-Warner automatic transmission, which will also be displayed at the Mack booth in a cutaway model. Second entry, shown above and representing on- and off-highway haulage, is the B8136SX, a 6-wheeled unit with 6-wheel drive. Booth No. 118 and 124.

Ford Motor Co. introduced a new line of heavy-duty trucks with a gross vehicle weight of 19,500 tons and up. New line includes tilt-cab units as shown above, and conventional and tandem units ranging from 25,000 to 51,000 lb gross vehicle weight.

Ford trucks are powered by gasoline, not diesel engines, because, according to a Ford survey, 80 to 88% of all trucks in the heavy field have been built with gasoline engines in the past 10 years. Engines in the new line will have horsepower ratings of 226, 260 and 277. Special feature of the engine design is a step-top piston which closes in on a wedge-shaped combustion chamber. Instead of conventional generators, the Ford system uses an alternator and a selenium rectifier to develop dc current. The only time the battery is used is to start the engine. Write to Ford for details. And if you're interested in diesel engines, Ford has them also.

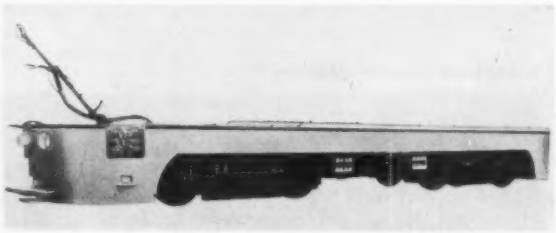
Lighter Cableway Bucket



Sauerman Bros., Inc.'s Slackliner bucket applies certain characteristics of its Crescent DragScraper to a new line of Slackline Cableway buckets—permits bucket to be made lighter for a given strength and requires less line pull than other buckets of the same rated capacity.

Slackliner, according to Sauerman, has a continuously curved cutting edge designed to quickly penetrate hard digging material and move it into the bucket with minimum resistance. This curve, they say, also give more tension in the cutting edge and much less bending stress.

Wide Range Electrical Line



General Electric Co. will feature the latest products and services designed to give mining companies complete systems in electrical equipment from one supplier. Some of the products to be shown are for both open pit and underground mining—dc motors and generators, ac motors, controls, transformers, transportation equipment, wire and cable. Booth No. 1314 to 1318.

Wheel-Motored Scraper

R. G. LeTourneau, Inc. has announced its re-entry into the mining industry with a new self-loading electric wheel scraper for strip mining, to be introduced at the AMC Show. LeTourneau notes that the scraper carries an electric motor in each wheel and requires no pushing for loading. Capacity is around 60 tons. The booth will also feature moving pictures illustrating how the same electric wheel system has been applied to "many different machines performing varied tasks for diversified industries in many parts of the world." Booth No. 713.

On-the-Job Display

Baldwin-Lima-Hamilton Corp., Construction Equipment Div., will use a display based on color transparencies which illustrate B-L-H products in use in the mining industry. Among the major earthmoving products shown will be Lima shovels, draglines manufactured at the Lima Works division of B-L-H, coal mining dump cars built by the Eddystone division and Austin-Western hydraulic cranes and graders. The firm has introduced two new products since the last AMC Show; a 70-ton capacity four-axle truck crane (see photo) with T-1 steel frame and frame component structure, and a "super boom" for cranes, shovels or draglines. One construction application of the super boom was a 200-ft boom plus a 50-ft jib to handle steel and concrete for a 24-story building. Ask for particulars at Booth No. 225.

The Vital Tendon—Wire Rope

Leschen Wire Rope Div., H. K. Porter Company, Inc. is prepared to show you numerous samples of the various types, sizes and constructions of Hercules Red-Strand wire rope and wire rope slings. Booth No. 1515, 1519.

Union Wire Rope Corp., subsidiary of Armco Steel Corp. says that their display will show that Union Wire's rope and slings have built-in quality that enables users to get more service—cutting costs. Check up at Booth No. 614.

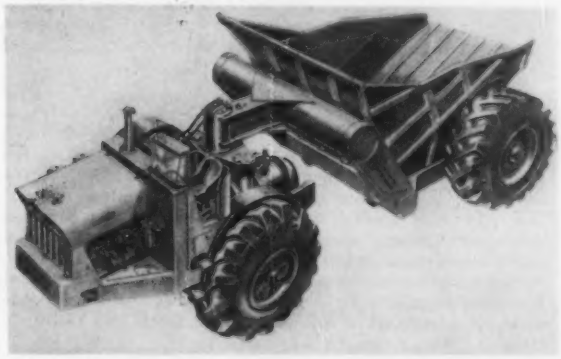
John A. Roebling's Sons Corp. (C. F. & I. subsidiary) will focus on the Herringbone Wire Rope, which the company calls "the new dual-purpose construction, combining the advantages of regular and lang lay."

They'll also feature Roeclamps and related cable, for quicker, cheaper installation of power source for mines and industrial plants. Booth No. 416.

Toughen Up With Special Steel

United States Steel Corp. leads off its display with the USS Lorig Aligner Self Centering rolls for conveyor systems. The greater strength and impact resistance of USS T-1 high strength steels provide longer service life and greater pay load to mining equipment, says the company, which will also devote space to Cor-Ten, Man-Ten and Tri-Ten high strength steels at its booth. Ask any of the USS men at the booth for full information on these newer products, and for all the dope on Tiger brand wire rope and electrical cables. They'll be glad to see you at Booth No. 300 and 301.

Adaptable Rear-Dump



Continental Copper & Steel Industries, Inc., Wooldridge Manufacturing Division will exhibit the Wooldridge Model CWD 221, 35-ton rear-dump unit shown above. It can handle a 35-ton payload at speeds in excess of 30 mph. Semi-trailer construction provides good maneuverability. The unit is equipped with full Allison transmission, torque converter and hydraulic retarder coupled to a 375-hp engine. Booth No. 725 and 729.

Providing a "New Look"

Shaft & Development Machines, Inc. will enjoy the hospitality of Machinery Center at the AMC Show to exhibit a moving picture, in color, of the vertical and incline Cryderman mucker and the Whup-d-Whup full train loader. Many Cryderman models are now in use, says the company, giving mining a "new look." Machinery Center will be at Booth No. 1724.

Quadruple-Threat Job

International Harvester Co. has your best interests at heart. They want you to see the new International Drott "four-in-one" Skid shovel, but they don't want to deafen you with its power. Solution is an electric motor which will power the hydraulic pump in place of the standard International diesel engine, and which will let you get real close to the combination bucket loader, clamshell, bulldozer and carry-type scraper. That'll leave an atmosphere for you to enjoy in your examination of International's other exhibit items; the TD-24 crawler tractor with tilt dozer, the Model 95 off-highway Payhauler and the ID TD-6 four-in-one. Booth No. 340 and 440.

Hooks and Shackles

Crosby-Laughlin Division, American Hoist & Derrick, is offering a new line of shackles, which the company says has a guaranteed capacity which is 50% higher per size than common shackles. Each shackle has the safe working load stamped on the shackle body, capacities range from ⅓ ton through 75 tons. Other new Crosby-Laughlin products include a latch kit for simply converting hoist hooks to safety hooks; a new load binder which can be acquired with Lebus hooks, clevis hooks or link ends; and a new solid thimble with holes up to 2½-in. Catalog 950-2 describes the thimble, 950-11A for the load binder, and Box 570 for the latch.

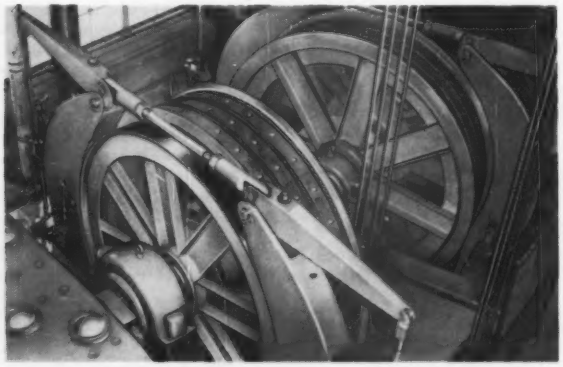
All-Around Tractor Display

Allis-Chalmers Mfg. Co. Tractor Group will have a TW-360 motor wagon, a TS-360 motor scraper, an HD-21 diesel-powered turbo-charged crawler with dozer and ripper, a stripped down model, with cutaways, of parts of the HD-21 crawler tractor at the Show. In addition, an HD-16 diesel-powered crawler tractor with torque converter drive and equipped with a dozer, a Model 45 motor grader, two tractor shovels (HD-6G and HD-11G), the Model D-516 diesel power unit, the D-844 fan to flywheel engine, the W-226 gasoline power unit, and the 6DAG844 100-kw generator set will be displayed. Tractor shown above is an HD-21, one of the types to be shown at AMC, but this one here is an experimental model having a gas turbine engine—ask about it. Booth No. 130, 140 and 240.

Ropes and Hoists

Macwhyte Wire Rope Co. will display the correct ropes for mining equipment, including Whyte Strand preformed and internally lubricated wire rope, Atlas braided wire rope slings, and Macwhyte Safe-Lock cable assemblies.

Macwhyte feels that costs can be cut and efficiency increased "through reduction of yearly rope costs by use of the correct construction, grade, size, for each rope plus correct lubrication supplied by Whyte Strand wire rope. There are more than 1001 wire ropes on the market and it is important to obtain the correct rope for each use on each piece of equipment." Booth No. 1117.



Aros Electric, Inc. won't be at AMC this year, so if you want to know more about the way Koepe hoists lower installation, operating and maintenance costs at increased safety factors, write to the company for details. Many new Canadian and U.S. mines have installed Koepes in the past few years.

Streamlined Weighing

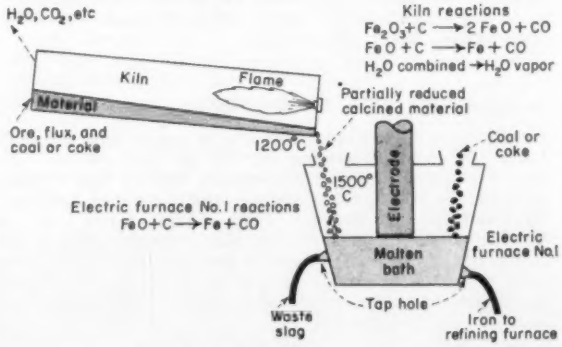
Builders-Providence Div., B-I-F Industries offers duplex weighing—a new-design weighing structure which features unitized construction. B-I-F says the new instrument improves efficiency and stability in the scale, simplifies installation and provides less surface for build-up of dirt and spilled material; therefore, less maintenance. There's more information available to you for the asking at the Providence address of B-I-F. Ask for Bulletin 550-P5.

Low Maintenance Valves

Grinnell Co. makes a strong case for its straightway diaphragm valve which: eliminates flow restrictions, causes minimum loss of head, self-drains completely, and is maintained very simply. In the latter case, since only the diaphragm wears and needs replacement, Grinnell notes that it can be replaced without removing the valve body, and that there are no metal-to-metal seats or need for packing. Another development is the use of PVC (polyvinyl chloride) in pipe, valves and fittings, so that no other material comes into contact with the fluid in the line. PVC bodies are available with screwed, solvent-weld or flanged ends in sizes from ½-in. through 2-in. Write to the company for full particulars.

Clarkson Co. Division, Equipment Engineers, Inc., will introduce a new Series C Clarkson slurry valve featuring a venturi-like flow. This lightweight valve responds to control by low hydraulic or air pressure. It is a true control valve for abrasive slurries offering lower maintenance costs because of inexpensive replacement parts involved. Booth No. 101.

Industry Contribution



Koppers Co., Inc., which is celebrating its 50th year of service to the industry, is proudest of its recent breakthrough, with Strategic Materials Corp. on a simple process for direct reduction of iron ore to pig iron or semi-steel. The process, which is described in a Koppers booklet, was also covered in *E&MJ's* Electrons and Ions issue, April 1958.

Show Visitor's Haven

Colorado Fuel & Iron Corp. Plan to relax when you visit this booth. CF&I's hospitality center welcomes all visitors at the Show. It has been designed to enable visitors to meet and visit with friends in pleasant, homelike surroundings. Complete secretarial service will be available to write letters, take messages, and help visitors in every way possible. CF&I's complete line of mining products will be on display, including Wickwire rope, industrial screens, grinding balls and rods, rock bolts, mine rails and accessories. Booth No. 1640.

Heavy Duty Feeders

National Iron Co. has introduced two new products since the last AMC Show, designed and built for one type of use. They specify it in the names of the two new items: "Hydro-Stroke" heavy duty reciprocating plate feeder; and "Nico" FD8 and FD4 heavy duty apron feeder. If heavy duty is what you need in your feeder application, check with National at the Duluth address.

Wire Screen Applications

Ludlow-Saylor Wire Cloth Co. and Star Wire Screen & Iron Works will be presenting the wide range of abrasion-resistant, corrosion-resistant and heat-resistant square opening and long opening woven wire screens and wire cloth. The abrasion-resistant group includes lead-tempered and oil-tempered high carbon steels, Starsteel and Super-Loy alloys. The latter find application, Ludlow-Saylor says, in vibrating screens. Other samples show all types of stainless and alloy steels. One model recommended to your attention is that which shows how fine-mesh sizing screens are supported by a coarse mesh backing screen. Booth No. 1626.

Wedge Wire Corp.'s feature at the Mining Congress will be their new T-Wedge, designed, as the company puts it, "to combine small wire efficiency with large wire economy, where large material and high abrasion screening application are a factor." Booth No. 1621.

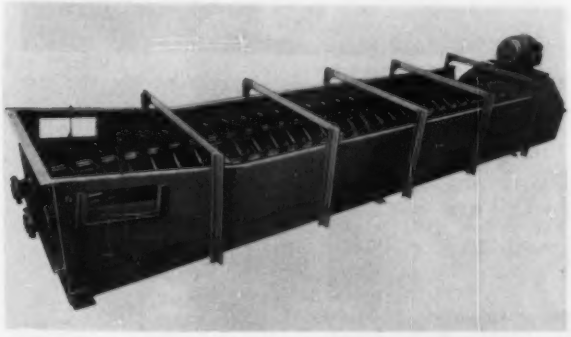
W. S. Tyler Co. will be presenting samples of woven wire screens of many different materials and meshes, along with Tyler Standard Screen Scale Testing Sieves. But the central figure in the display, Tyler says, will be the latest model Ty-Rock screen of the type most used in the mining industry. Booth No. 1426.

Service Across the Board

Southwestern Engineering Co.'s presentation will include the Krupp-Renn process for the direct reduction of iron ores (Southwestern is exclusive licensee in this country for the engineering and construction of this process), plus demonstrations of the Sweco vibrating screen separator for accurate classification. The exhibit will also show design, engineering and construction services for all types of metallic and non-metallic mineral processing (including integrated mills, as well as special facilities such as heavy media separation plants).

Robert P. Miller, Sweco president, plus a large group of fellow company officers, will personally be on hand to participate in the exposition. Booth No. 223.

New Slurrying Unit

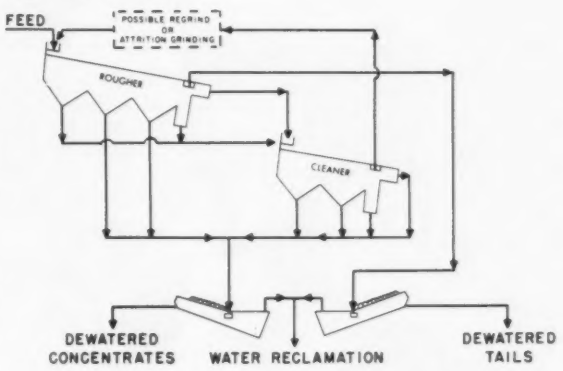


Eagle Iron Works has a new product to speed the making of slurries and provide a more uniform slurry for iron ore, manganese, and other ores. The new ore slurrying unit has already met with great interest in the industry. You can obtain full information by writing to the company at the address listed in your mid-June Buyers' Guide section of *E&MJ's Guidebook*.

High Frequency Dry Sizer

Machinery Center, Inc. will be operating a Mogensen dry materials sizer at its booth, and invites your questions and inquiries. The machine, in sizes from ½-in. to 1 micron, is a high-capacity, non-binding, high frequency vibrating screen. Booth No. 1724.

Jigs Can Rough It



Western Machinery Co. will state its case simply and clearly at the Show. Star players will be a 5x16-in. Wemco-Remer jig and a four-cell, full size Wemco Fagergren flotation machine, along with a color movie on jigging process and other films on heavy media separation and solids pumping. It's a complete show and worth all the time you can give it.

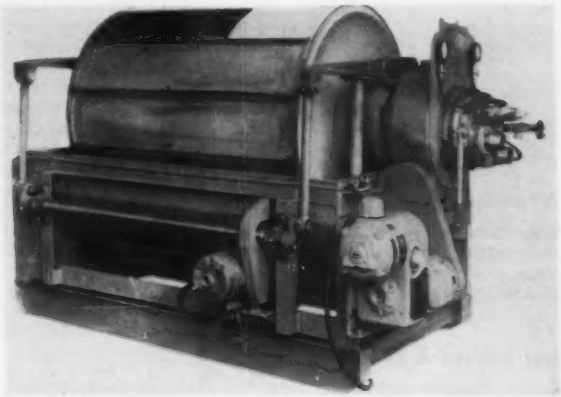
If your interest is aggregate preparation, Wemco has a 40-page booklet (G7-B25) featuring charts, drawings and photos, along with complete engineering data for 10 Wemco machines used in aggregate production. You may write for it to Wemco Products Div., care of Western Machinery. Talk to the men at Booth No. 105.

Cyanamide Source Book

American Cyanamid Co.'s Manufacturers Chemicals Dept. has a booklet which may hold the answer to one of your problems. It's a source book, 60 pages, which "shows how calcium cyanamide's unique properties permit it to join cooperatively with other chemicals in many different ways so that it has become the starting point of hundreds of compounds useful to man." You can get it by writing to the Manufacturers Chemicals Dept. Booth No. 1415.

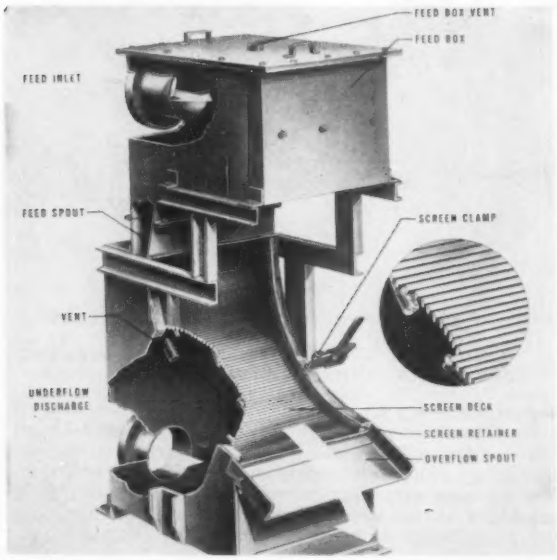
Novel Filtration

Eimco Corp. will exhibit filtration equipment, thickeners and its full line of processing equipment at the Show. They invite your questions on "some novel ideas" which they promise to present at Booth No. 125.



Dorr-Oliver, Inc.'s latest development is a Fiberglas rotary vacuum filter which costs less than rubber-covered or stainless steel models. The drum is Fiberglas; tank is molded plastic supported on a steel frame. Unit has been tested in U.S. uranium mills on acid circuits.

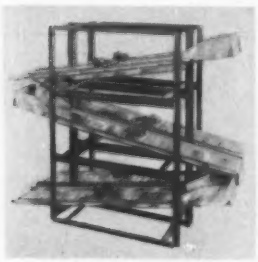
Screening the Wet Stuff



Dorr-Oliver, Inc.'s most recent development has been the manufacture of the Dutch State Mines designed screen shown in cutaway above. DSM screen is especially suitable for continuous wet screening of non-fibrous slurries in the 8-48-mesh range. Capacities based on one foot screen width are 200 gpm at 48-mesh and up to 500 gpm at 8-mesh, depending on type of feed.

Electrostatic and Gravity

Dings Magnetic Separator Co. recently secured rights for world-wide manufacture and sale of the Coronatron electrostatic separator designed and developed by Quaker Oats Co. Availability of the electrostatic equipment will supplement Dings' line of dry high-intensity magnetic separators. Write for details.



Bush Engineering & Mfg. Co. The company's T&R classifier-concentrator shown here is a gravity separator. Advantages of the unit are simplicity of operation, low operating cost and large capacity. The gravity concentrator is used to classify, upgrade, deslime finely divided mineral slurries. Booth No. 1340.

Extending Screen Life

Bixby-Zimmer Engineering Co. All rod shapes of Bixby-Zimmer welded stainless-steel screens will be displayed. These products are designed to increase screen life and screen capacity. Booth No. 1223.

Fast Research Results

Carpco Research and Engineering, Inc. Write to the company for a new book showing the company's new laboratory and pilot plant facilities which will be used by the engineering staff to work out technical problems related to mineral extraction. Just completed is a new spiral plant for closed circuit, three-stage tests that is capable of handling feeds up to 10 tph on a continuous basis. A continuous, completely mechanized, high-tension and magnetic separation dry mill will be set up in the new building. Materials handling equipment has been installed at the rail side to enable the company to handle bulk material for testing speedily.

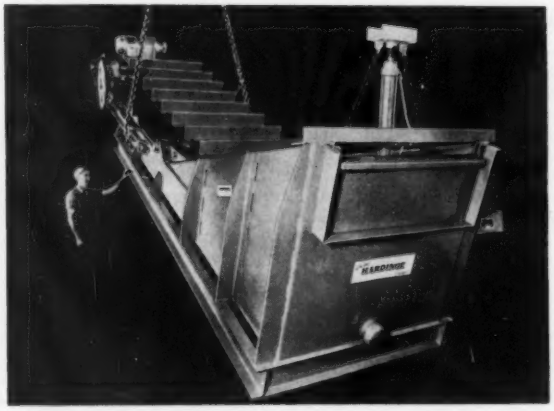
Drying the Product

Standard Steel Corp.'s main display idea contains a series of large photographic blow-ups of dryers, coolers, kilns, calciners, and special rotary equipment that it has installed in mines and refineries around the world.

The principle of the saw-toothed lifter will be clearly shown in a cross sectioned working scale model of a typical rotary dryer. Company sales engineers and executives will be on hand to discuss rotary dryer problems with any and all comers. Booth No. 1545.

F. L. Smidth & Co. "We'll feature scale models of Smidth rotary kiln with Unax cooler and a ballmill driven by Smidth Symetro drive direct through the trunnion. Smidth rotary kiln with Unax cooler insures reliability of operation combined with lowest fuel consumption. Smidth ballmills with Symetro drive reduces power consumption and eliminates maintenance and repair on mill drive." See Booth No. 616.

Improved Classification



Hardinge Co., Inc.'s newest classifying device—the Hardinge Overdrain will be prominent among the Hardinge line. Overdrain is a belt-type classifier. In operation, the scrapers cause a downward movement of the pulp which is then moved up the tank to discharge, deslimed and relatively dry at the top. Slimes flow up, through drain holes in the belt. Final drainage takes place through holes in discharge shroud. Also on display will be the Tricone mill and Electric Ear grinding mill control system. Booth No. 1200.

New, Smoother Drives

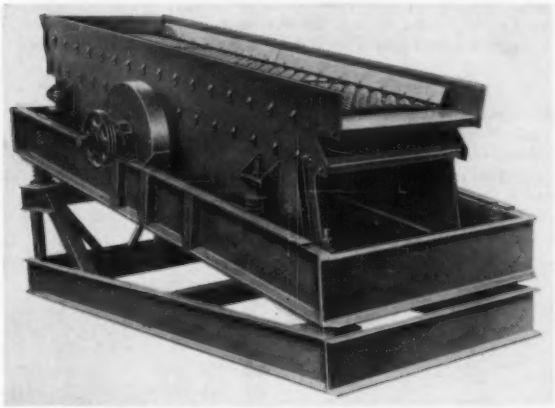
Lippmann Engineering Works Inc. has developed a hydraulic drive system for their movable crushing and conveying units for pit and quarry. Smoother and more simple in application, this method of driving lessens vibration, noise and maintenance and improves power transmission with steadier application of power. Hydraulic motors are used for individual driving units on the various plant components. A number of Lippmann hydraulically driven plants and conveying units are in operation in the U. S.

Mill Liner Investigation

American Managanese Steel Div., American Brake Shoe Co. Look for a miniature ballmill which will be operated to show the benefits of double-wave ballmill liners. Booth No. 215.

Vibrating Screens

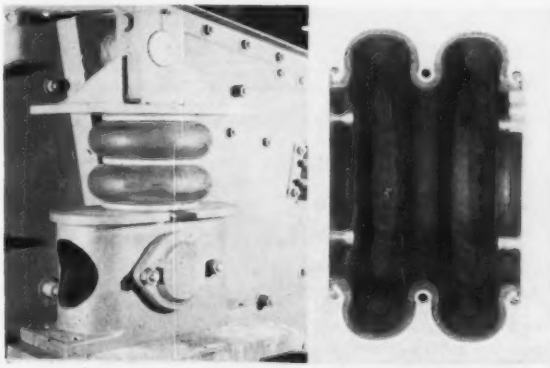
Deister Concentrating Co. has literature available on the Concenco 308 and 309 low-head distributors, and Leahy Vibrating screen Model E (with high motor mount). Leahy Model E provides high screening efficiency on any fine sizing operation, particularly media recovery in specific gravity separations.



Pioneer Engineering Div., Poor & Co., Inc. says that the method developed for secondary suspension of their new vibrating screen shown here is unique—the entire screen and frame is in effect floating between the upper and lower springs so that both upward and downward vibrations normally transferred to the rest of the plant are neutralized, putting all the screen motion into the screen itself. System increases screen capacity, improves separation and reduces cost, says Pioneer. Booth No. 216.

Productive Equipment Corp. will exhibit a double-decker base-mounted Gyroset vibrating screen in the 4x10 ft size for service in inclined screening of dry materials, or flat operation, and in some instances even uphill work. Screens are also used to dewater slurries. Write for literature (bulletin No. 574), or stop at Booth No. 1326 & 1328.

Air Springs for Screens



Allis-Chalmers Mfg. Co., Industries Group. A Translite pictorial will show a package dry-grinding plant with a 15-in. vibrating mill which mineral processing engineers everywhere have been waiting to see. The package dry-grinding plant affords greater productive capacity in a smaller area. Vibrating screens with air springs, see illustration above, which are designed to isolate vibration and cut maintenance costs, will also be on display. Write to the company for Bulletin 07-B-8931 which describes and illustrates the new air-spring vibrating screen. Booth No. 130, 140 and 240.

Clearing the Air

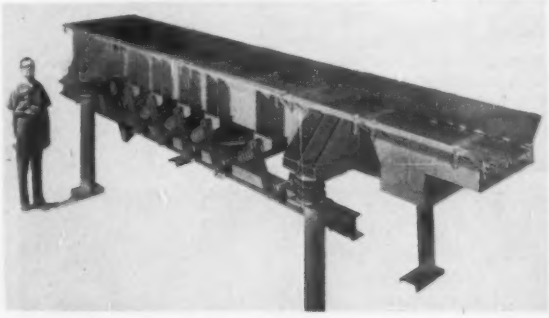
American Air Filter Co. will display their complete line of wet and dry dust control equipment—all in operation. One unit to be shown is the Roto-Clone Type N hydrostatic precipitator, illustrated here in cutaway. Check the booth, or write to American Air Filter Co. for more details (bulletin No. 277B). Booth No. 111.

Taking the Size Down

Pioneer Engineering Div., Poor & Co., Inc. will exhibit their newly developed intermediate size jaw crusher which has a 20x36-in. feed opening and can break to 3 inches. Size 2036 has longer jaws for better gripping angle, hydraulic adjustment, split hub flywheels and improved toggle action. See it at Booth No. 216.

Nordberg Mfg. Co., through working models, movies and photographs, will show how design features in grinding mills, Symons primary gyratory crushers, Cone crushers, Gyradisc crushers, Type F screens, V screens, bar and rod grizzlies help the mine or mill operator cut operating costs and improve performance. Booth No. 1523 to 1527.

Moving Hot and Heavy

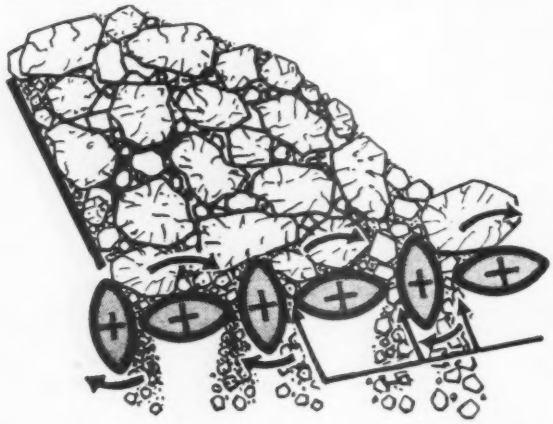


Carrier Conveyor Corp. has recently introduced a new high-temperature grizzly feeder, shown above. This trough design is used in both Carrier conveyors and feeders when materials as hot as 1800 deg F are to be conveyed, screened, quenched, cooled or otherwise processed during conveying operations. With the Carrier "Natural Frequency" system, the springs are used as drives rather than simple supports. The unit can handle weights in excess of 14 tons without dampening, and with relatively low horsepower. The only moving parts in the conveyor are at the drive which can mounted where most convenient. Write to the company for new information bulletin No. 44.

Five HMS Models

Ore & Chemical Corp., with Paul C. Cayard in charge, will present a working model of their Heavy Media separator vessel. Five models are available in capacities up to 400 tph feed. Laboratory size model will handle 1000 lb/hour. Booth No. 914.

Feeding Wet Material



Universal Engineering Corp. plans to have the Universal Wobbler Feeder and Universal "Screen Master" horizontal vibrating screen at their show booth.

Universal says the "Wobbler Feeders in operation have reduced grizzly maintenance, saved on installation and manpower costs, and increased production. It made possible the feeding of wet, sticky material for more efficient operations. The "Screen Master" full screen area gives greater capacities and closer gradation through controlled vibration with a minimum of maintenance with its interchangeable and simplification of design parts." Booth No. 531.

Photographs to Tell a Story

Traylor Engineering & Manufacturing Co. will have photographs of their process equipment—jaw crushers, gyratory crushers, rolls, mills, kilns, feeders etc.—at Booth No. 1319.

Special Nozzles

Spraying Systems Co. can provide nozzles for any type of spraying application that you desire—fog, flat, full-cone, hollow-cone, cooling, atomizing, cleaning, break-up, etc.

New Design Sieve Shaker

Wheeler Co., Inc. The sieve shaker which this firm plans to show at the Congress has been labeled lightweight, accurate, and able to take any standard make of sieves of varying diameters to grade either coarse or fine grained material.

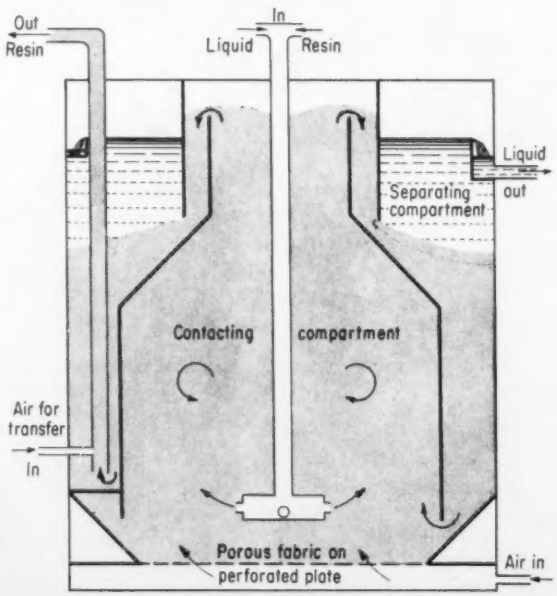
Wheeler adds that the shaker's other features are: (1) it's mounted on adjustable feet, (2) all parts are easily accessible for inspection, (3) motor is equipped with automatic variable speed pulley, (4) vibration is eliminated from the base, and (5) an adjustable pin device rotates the turntable.

Flocculants, Agents and Reagents

Dow Chemical Co.'s Mining Chemicals Sales group will set up a hospitality booth—a comfortable place to relax and discuss new chemicals and methods. We'll see you there. You'll have a chance to discuss flotation, flocculants, chelating agents and ion exchanger resins, and see how Dow products can increase metal recovery and reduce operating costs. Booth No. 1526.

American Cyanamid Co. Information will be available on Cyanamid's standard products for sulphide and native metal flotation, the Aero Xanthates, Aerofloat promoters, the 400 Series Promoters, Aerofroth frothers, and Aero brand cyanide. Also featured will be the new flocculant, Aerofloc, and Aerospray 52 binder which is used to prevent wind and rain erosion of mineral and coal fines. Booth No. 1415.

Basketless RIP



Infilco Inc.'s continuous countercurrent, basketless resin-pulp ion exchange plant has no moving parts—the resin mixing and transfer is by air. The resin flows through a bank of "loading" cells countercurrent to the flow of pregnant liquor. The resin next enters a bank of "elution" cells through which it passes countercurrent to the flow of eluant, and then returns to the loading bank. It is said to be outstandingly useful for the recovery of uranium and other anions and cations from pulp in a continuous system.

The company's Viscomatic lime slaker is a compact, high capacity unit for continuously converting unslaked lime into a hydrated lime paste which can be diluted to a slurry and fed into a processing circuit for acidity control and other reactions in flotation, water treatment and flocculation.

For Flotation Men

General American Transportation Corp. has literature available on the General American flotation machine and the Turbo-Mixer side-entry impeller. Also ask about their line of materials handling and transportation equipment. See *E&MJ* Mid-June Mining Guidebook's Advertiser's Index for address.

Improved Cyclone Apex Controls

Equipment Engineers, Inc. will set up shop with a full line of single and patented two-stage Krebs cyclones equipped with the new hydraulic or air-operated apex controls and super-ceramic fixed apex orifices. A central feature of the booth will be an operating cyclone.

Clarkson Co. Div., Equipment Engineers, will introduce the Model C Clarkson slurry valve which has a venturi-like flow and design to provide a lighter weight valve for responsive control at lower hydraulic or air pressure. Clarkson feeders Model E in 18-8 stainless steel and acid-proof PVC, will also be shown. Booth No. 101.

New Roles for Micronizer

Sturtevant Mill Co. has announced that fluid energy mills with no moving parts (modified Micronizers) have successfully ground particles down to the half-micron size.

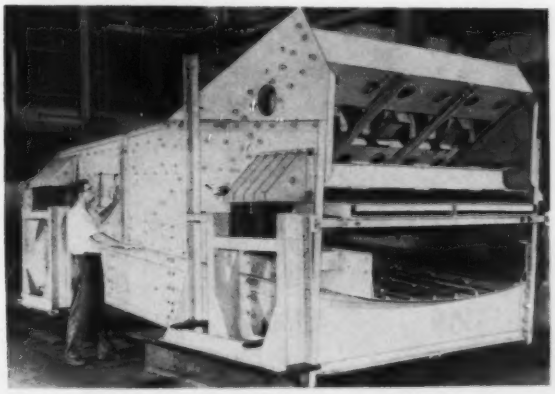
The Micronizer works on the principle of super-speed rotation of particles produced by jets of compressed air or steam, which causes violent particle impact and results in fine pulverization without attritional heat. Tests have shown that certain materials behave in totally different ways when reduced to particle sizes in the lower micron range.

Sturtevant board chairman, W. T. Doyle, said that "behavior efficiency in dispersions and blends can be made considerably more effective through micron-size particles. The variety of materials that can be reduced to submicroscopic sizes is growing every day. New materials are being tested and work is in progress to adapt the Micronizer to handle extremely hard and abrasive materials."

For Grinding Jobs

Capitol Division, National Malleable and Steel Castings Co. will exhibit grinding balls, mill liners and miscellaneous castings manufactured for the mining industry at Booth No. 115.

Vibrating Equipment

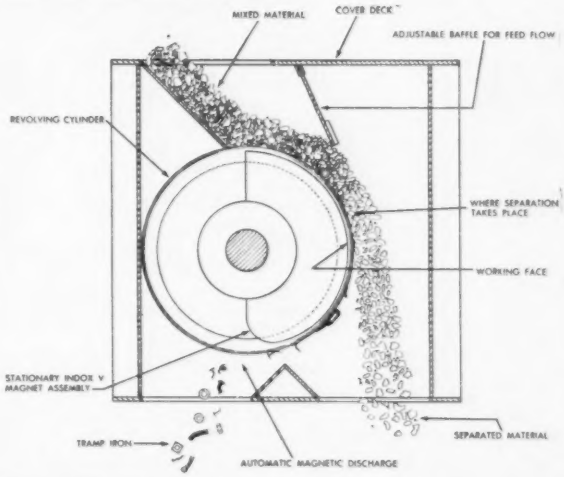


Dravo Corp. has been licensed by Carl Schenck Co., Darmstadt, Germany, to manufacture Schenck-designed vibrating feeders, screens and conveyors in the U.S. Key feature of the Schenck equipment, according to Dravo, is "an exciter element which imparts a 'micro-thrust' movement to materials being moved or screened." The result, the company says, is low wear, resistance to high temperatures, low headroom requirements, and minimum vibration. A helical vibro-conveyor for vertical transport is included in the new line. Dravo has Bulletin No. 1475 with the full story.

Unique Classifier

Buell Engineering Co. will have an exciting display, and one worthy of a visit by all visitors interested in mineral processing. They put it this way: "Buell will feature the new Centrifugal, Gravitational, and Inertia-Gravitational classifiers. These new units employ unique combinations of aerodynamic forces to separate fines from coarse material at efficiencies unobtainable in present commercial practice. Working models with observation ports will be on display, and descriptive technical literature will be distributed." Other literature on Buell's electric precipitator and cyclone-type dust collector will also be available. Booth No. 1709.

Ceramic Magnet Separator



Stearns Magnetic Products has produced a new permanent magnet drum which "is the latest development in a line of high-efficiency tramp iron separators using Indox V ceramic magnets." The new separator was designed for easy installation in any enclosed chute or spout conveying system.

A revolving stainless steel cylinder inside a welded steel housing carries material over a stationary Indox V magnet assembly. According to Stearns, the Indox V magnets produce an exceptionally uniform field up to 40 times more powerful than could be achieved with ordinary permanent magnet materials. Tramp iron particles are picked up and rejected continuously and automatically, with no interruption of the material flow.

The new drum separator, says Stearns, is recommended for positive tramp iron protection in process industries, or wherever iron particles must be removed from a granular product.

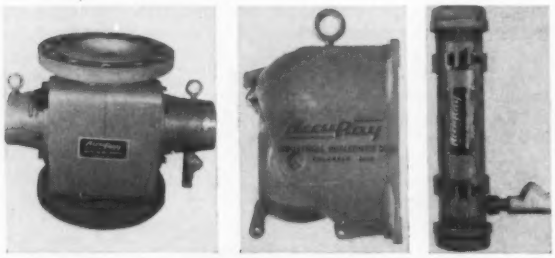
Filter Media Support

National Filter Media Corp. will have available for inspection their chemically-inert screen-like material for support of filter media. Called Trilok, it is woven of plastic monofilaments. It provides more even support for filter media and is said to be much cheaper than conventional corrosion resistant stainless steel screens, rubber covered grids, etc. It takes the place of the normal drainage grids, screens or slats. See it at Booth No. 1118.

Problem Drinker

U. S. Rubber Co. says that Mr. Uscolite, a huge mechanical man made of tough, corrosion resistant pipe, will be the top attraction at their AMC booth. Mr. Uscolite will take a drink of corrosive mine water right before your eyes to remind you that, as U.S. Rubber says, Uscolite pipe is finding wide use in the mining industry for its corrosion resistance. Some of the other products on display are asbestos and rubber sheet packing, electrical tape, conveyor belting, pilot flexible pipe, leaching hose and a new Dacron fire hose. Booth No. 505.

Exact Measurement



Industrial Nucleonics Corp. will exhibit their Accuray Control Systems which employ gamma ray emanations from a radioisotope to measure and/or control density and bin or tank levels of liquids, slurries or divided solids.

The flow density measurement system is attached to the outside of a pipe section and makes no physical contact with the flowing material. Liquid/solid ratio can be controlled or recorded by conventional mechanisms. Automatic compensation for temperature can be built in.

The level detection-control system likewise employs two attachments—source and detector—on the outside of the tank or bin. It is unaffected by any change in temperature. Simple thyratron controlled relay provides output signal. Explosion-proof model is made. See Booth No. 317.

Speed Reduction

Link-Belt Co. will show a parallel shaft gear reducer and allied power transmission products. At Booth No. 311.

David Brown, Inc.'s exhibit will include Radicon worm reducers, Helicon and Varicon speed reducers, gear motors, cone ring couplings, and the Type S helical worm box.

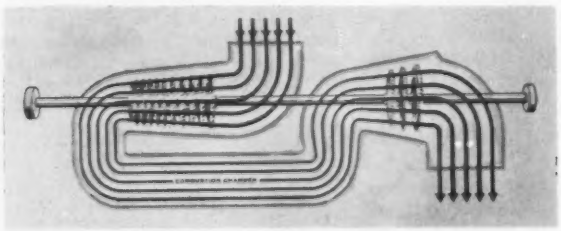
Booth visitors will be able to watch a full-size transparent model of a Radicon worm reducer, complete with lubricants, coupled to an electric motor. Booth No. 1224.

Western Gear Corp. plans to display its Straitline gear motors and Speed Master speed reducers.

The company has stated that "Western Gear integral and all-motor type gear motors are companion products which may be converted by simply interchanging motor packages easily and quickly in the field without disconnecting the gear motor from its foundation or the driven shaft."

The Sky-Climber will also be at San Francisco. This, says Western Gear, is a lightweight, safe, hand or motor operated cable hoist which is equipped with a bucket seat for workers on tall drops or can be paired up for use in all swing stage applications. Booth No. 425.

Gas Turbine Engine



Solar Aircraft Co. puts it pretty simply when they call the new Solar Mars and the Solar Jupiter gas turbine engines "the power plants in your future." The engines, according to Solar, are "simple, compact and lightweight . . . burn any fuel, and can be used in a number of mining applications." A most exciting booklet can be obtained from Solar's Turbine and Control Sales Dept., 2200 Pacific Highway, San Diego 12, Calif.

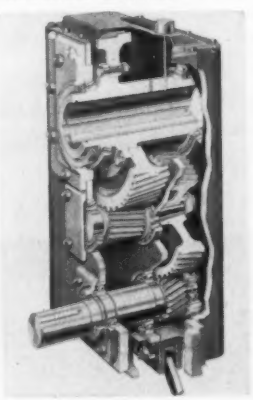
Cables and Fault Locator

Ohio Brass Co. will feature their cable fault locators and their power cable connectors. The fault locator is a $125, 4-lb, pocket-size investment for quickly and easily finding a frequent cause of costly downtime. Their Type CS and CSA connectors for copper or aluminum power lines make all single-conductor cable inter-connectable simply by tightening two set screws once the connector halves have been screw-clamped to the cable ends. Different size cables, as well as aluminum-to-copper, tap-off, three-way and straight-through connections, all can be handled. See them at Booth No. 1215.

Western Insulated Wire Co. is all set to show its Bronco 66 type W and type G cables in both round and flat twin parallel varieties. They'll also show high voltage cables, types designed for prolonged service on payout and retractable reels, and a demonstration of a unique "self-measuring" feature and branding. Ask the men at the booth for a copy of the Bronco 66 reference catalog. Booth No. 1722.

General Cable Corp. will present all types of wire and cable for mining use, featuring Super Service mining cable and Supertuf jacket. Literature available says excellent mechanical and chemical properties of Supertuf insure maximum lasting toughness, high density and tensile strength, elasticity, smooth wear, cut and tear resistant surface. Super Service catalog is 56 pages. Booth No. 1628.

Mounted Drives



Falk Corp. developed two new series of drives—the 315J Shaft Mounted drive shown left in cutaway, and the Falk Flange Mounted drive just now going into production. For literature on Shaft Mounted drives ask for Bulletin 7100 (31 pp), and for details on the newer Flange Mounted drive ask for Bulletin 7140. Flange Mounted drive will be available for horizontal or vertical use in horsepower applications of ½-10 in single reduction, and ½-5 for double reduction.

Electric Motor Show

Westinghouse Electric Corp. is combining the "soft sell" with one of the most entertaining exhibits you've seen. The famous "Syncopated Waters" will be featured at the Booth. This display involves water fountains which dance to music, and which have delighted audiences all over the world. The backdrop will show electric motors, transformers, gearing and repair service, a la Westinghouse. Ask for more information at Booth No. 305.

Continental Motors Corp. will be at the Show, but they're not saying what they'll have to show you—its a secret 'til show time, so you'll just have to drop by for a look. Booth No. 1629.

Long-Lived Hose

Thermoid Co.'s exhibit will have its Thunderbird air hose as center of attraction. A recent bulletin said that the Thunderbird wire braid air hose was light, very flexible, could withstand heat and pressure, and had maximum abrasion resistance.

Thunderbird is available in sizes from ⅜ in. to 4 in., with working pressures up to 400 psi air or 2,000 psi water. Booth No. 512.

Shovel Points and Adapters

Electric Steel Foundry Co. will make every effort to provide a comfortable booth with easy chairs and a water cooler. They cordially invite you to come in and relax, and also to take a look at Esco shovel points and adapters (cast alloy steels). Booth No. 1330.

Low Maintenance Remote

Mine Safety Appliances Co.'s transistorized audio tone transmission (TATT) control and indication equipment was developed for mining applications where remote control or indication is desired at a central location. As many as 30 functions can be handled over a single pair of wires up to 30 miles from the control station. Designed on the building-block principle, the compact components have a simplified circuitry employing transistors and tone oscillators to make maintenance far below normal standards of today, according to the company. As they say, "we believe it will become a vital factor in the automation of mining properties." See it at Booth No. 1500.

Rotary Compressors

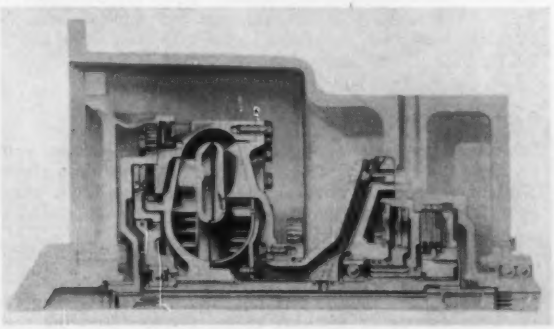
Fairbanks, Morse & Co. will mail literature, on request, on the Fairbanks-Morse positive-displacement axial-flow rotary compressors. Units are available for process air in single and double stage compression with capacity ranging from 800-13,000 cfm.

Jaeger Machine Co. is bringing examples of its power to the show. Two sizes of the new line of electric-driven, rotary 2-stage oil-cooled, sliding vane stationary compressors will be seen, one a 600 cfm, 100 psi, 150hp model and the other a 125 cfm, 100 psi, 30hp. Each is complete with magnetic reduced voltage starters, constant speed control and air receivers. Two Jaeger mine pumps, a 4-in. dewatering unit and a 2-in. vertical type will also be on view. Booth No. 100.

Economical Battery Power

Exide Storage Battery Co., Exide Industrial Div. says, "We'll feature the new Exide-Ironclad batteries with armored porous tubular positive plates. The higher capacities of these new batteries make possible longer hauls by locomotives and trammers in metal mines at a lower cost per ton-mile. Also featured will be a typical mine charger manufactured by the Electric Products Co. and marketed exclusively by Exide. Our booth is No. 1228."

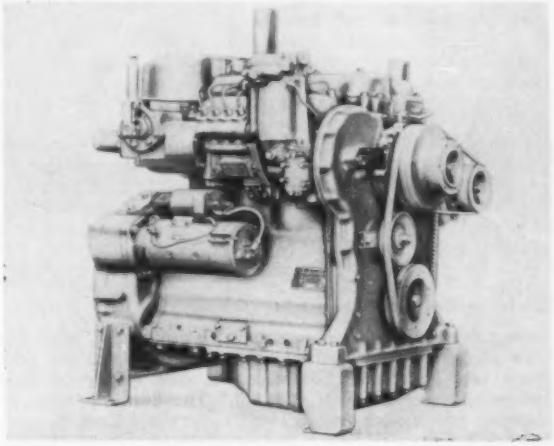
Finger Tip Drive Control



Twin Disc Clutch Co. will show you a cutaway section of their single-stage converter with direct drive and master clutches. New single-stage converter permits the operator to go from converter drive to direct drive with finger tip control. A vehicle using Twin Disc's unit has all the advantages of torque converter multiplication when needed, but has the efficiency of direct drive for high speed operation when torque multiplication is not necessary, says the company. Cutaway shown above will be seen at Booth No. 612.

Big Diesel Power

Cummins Engine Co. emphasizes the rugged, heavy duty design of their diesel engines, which, the company says, provide outstanding performance and economical operation. At the AMC Show, Cummins will spotlight the 375-hp V-8 engine; the 6-cylinder, 375-hp NFT; the 320-hp NHRS-TC; 450-hp NVH-12; and the 75-hp generator set, J-4. Cummins will be at Booth No. 640.



Caterpillar Tractor Co. will introduce a new heavy-duty industrial engine at the show which is designated as the D311 (Series H) line. The new engine, shown above, has four cylinders with 4-in. bore and 5-in. stroke. It develops 75 hp maximum at 2400 rpm and 50 hp, continuous, at 2000 rpm. As a diesel-electric set, the unit develops 30 kw continuous rating. Completing the display will be the D353 diesel-electric set rated at 390 hp, maximum. It produces an output of 200 kw for primary or stand-by power for remote mining developments. Booth No. 825, 831 and 837.

Detroit Diesel Engine Div., General Motors Corp. will present a 210hp truck motor and models for other mining equipment requiring comparatively small, lightweight engines of high power output. Detroit's 210hp model is a six-cylinder Series 71 unit. Other models displayed will be in activated cutaways. Booth No. 415 and 516.

Utica Div., Curtiss-Wright Corp. will set up shop in Booth No. 632 with a display of five Mercedes-Benz diesel engines — MB 837 Aa, 564hp at 2200 rpm and weighing only 3000 lb; OM 321, 96hp at 2600 rpm and weighing 780 lb; OM 636, an industrial unit with power take-off, 36hp and 400-lb weight; OM 326, a 95 kw generator set; and heavy-duty M204 B, a pumping unit. All Mercedes-Benz units sold by Curtiss-Wright are manufactured in the U.S. There are 24 models ranging from 36 to 3000hp in the M-B line. Booth No. 632.

Sheathed Cable

Simplex Wire & Cable Co.'s show area will spotlight the company's new Tirex products which are, according to Simplex, designed to meet the more rigorous conditions of today's mining operations. Along with the Tirex items, there will be samples of C-L-X sheathed cable for electrical supply, distribution and control circuits in all environments.

Simplex feels that cables can now be selected solely on the basis of electrical requirements—their C-L-X sheaths will provide all necessary mechanical protection. They'll be glad to see you at Booth No. 1214.

Special Steels for Industry

Jones & Laughlin Steel Corp. has an exciting range of new products to offer industry, ranging from new containers for shipping corrosive liquids, through high pressure piping materials and electrolytic zinc-coated sheets to that most basic of all materials, the common nail. But J&L's new nail is not so common. The "Ardox" spiral nail differs from other spiral types in the economy of its price, and from standard nails in its ease of use and improved performance. Greater holding power, ease and economy in use, and lower cost per nail are the major benefits. Write to J&L for the full story, and for information on the tubing and zinc-coated sheets, too.

Crucible Steel Co. of America will exhibit samples of its full range of specialty steels for the mining industry. Individual panels will show drill steel, high-speed steel, stainless steel and wire, cold-rolled steel, permanent magnets and heavy industrial springs. Write for or request a useful booklet, "Crucible Special Steels for the Heavy Construction and Mining Industry," which covers the complete line of specialty steels and lists 12 technical aids available for mining men in the form of pocket charts, steel selectors, and stainless steel selectors pertaining to welding, tool steel, hardsurfacing, drill steel, alloy steel applications, high-speed steels, and steel warehouse products. Booth No. 306, 312 & 316.

Unique Cement Products

Sika Chemical Corp. plans a threefold show this year. The first part features Perfo roof bolting system which the company says "offers the advantages of roof bolting in areas where conventional bolts will fail." The display's other remaining two sections center around Sika quick-setting compounds for sealing leakage, and Plastiment retarding densifier for concrete which permits a longer period of placement yet develops high strength more rapidly than plain concrete. Booth No. 1700.

Dipper Tooth Forging Display

H&L Tooth Co., with over a quarter of a century spent in the manufacture of two-part teeth for mining equipment, will feature various sizes of drop forged adapters and hammer-forged, heat-treated replaceable points with exclusive flexpin type connection. Special item will be the bulldozer corner adapters with replaceable points on a mock-up of a dozer blade. Want to see how these teeth and points are forged? Drop in to Booth No. 511.

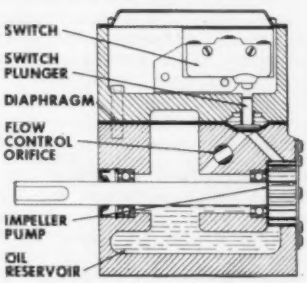
Better Valve Control

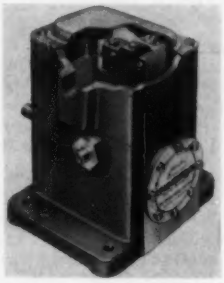
Red Jacket Co., Inc., to show valve throttling characteristics and construction features, will have a 4-in. valve operating at its booth. Representatives feel that Red Jacket's rubber valves will offer better control because of a full round port and that customers will have less maintenance costs — rubber valve can withstand greater abrasion than its metal counterpart. Booth No. 1109.

Mighty Midget

Griphoist, Inc. will display three feature items—the standard Griphoist with improved crankshaft and safety hook; the new Griphoist Model T-35 that can lift or pull a 3-ton load on 5/5-in. wire; and Pul-Mite, a 1,000-lb-capacity wire puller. Take a look at Booth No. 1717.

New, Accurate Indicator





Bin-Dicator Co. has developed a new motion indicator, shown above, which actuates warning lights or other alarm signals when machinery stops or speed slows up. It is designed to protect conveyors, elevators, feeders, and belt conveyors. Write to the company for Form RG-16.

Fasteners and Tools

Flexible Steel Lacing Co. will display Flexco belt fasteners, hinged belt fasteners, Farpul belt clamps, fastening tools, and the new Rema self-vulcanizing rubber repair materials. Write for details or check Booth No. 1518.

Ridge Tool Co. will use the 1958 AMC Show as the introduction site for four new pipe tools. The first, Ridgid No. 315, is designed especially for easy cutting of hard-to-get-at tubing, by short quarter turns. Cutting wheels have replaced the two rolls—cutter capacity is 3/16 in. to 1-1/8 in. O.D.

Ridgid No. 450 portable tri-stand top-screw chain vise features a large easy-to-operate crank handle on top of vise where it's handy for fast chain tightening.

The company's Model No. 161 is a 4-6 in. geared pipe threader which, according to Ridge Tool, is jam-proof for safe threading with power drive.

The last of the newcomers is the Ridgid hex wrench, designed for use on all finished or unfinished hex nuts, and Ridge Tool says it's especially helpful in work on valve packing nuts or valves in service. Booth No. 900.

Rust Prevention

Rust-Oleum Corp. will exhibit rust preventive coatings for severe conditions. These coatings, compounded of low-surface tension fish oil, penetrate deep into rusted surfaces and are said to prevent further rusting of sound rusted surfaces. There are many colors to select from and many specialized formulations to fit particular applications. As a highly decorative finish on new surfaces, the coatings are said to have the advantages of greater coverage and fast application as well as lasting beauty. See Booth No. 1122.

Portable Water Cooler

Schlueter Manufacturing Co.'s Artic Boy portable water coolers are hot-dipped galvanized and lined with Sparkleen plastic. The company says it is 100% sanitary, leak-proof, rust-proof, odor free and taste free.

Wear Resistant Liners

Los Angeles By-Products and Los Angeles Steel Casting Co. are joint tenants of a booth at the Show, illustrating their varied services. The steel firm will be emphasizing wear resistant liners and corrosion resistant castings for use in the mining industry as replacement parts. A model railroad display by Los Angeles By-Products, will point up the transport of precipitation iron for use in copper leaching plants, one of the firm's major operations. Booth No. 525.

(*Continued on p 118*)

ENGINEERING AND MINING JOURNAL'S HINTS ON . . .

Food and Fun in SAN FRANCISCO

Food and Fun in SAN FRANCISCO

Compiled By The Gourmets of McGraw-Hill Publishing Co., San Francisco, Calif.

MINERS AND MOUNTAIN MEN, sailors and other seafarers, vaqueros and vagabonds, prospectors and peddlers, tourists and world travelers all have looked to San Francisco since the golden spark of 1848 as a mecca for food and fun. In the City by the Golden Gate good food is a tradition. Here the colorful personality and exotic beauty that is San Francisco—the sky, air, sea, hills, fog, sights, spirit and moods—are transmuted into food to tantalize the epicure.

Asked what in his opinion had established San Francisco as a gourmet's paradise, one veteran bon vivant once said, "Hell, we had to learn to eat out and like it. There were no good women to give us home cooking!" So it is that no city can boast of a greater variety of fine food or colorful and vigorous fun than the city of San Francisco.

In a city as cosmopolitan and Bohemian as San Francisco, eating takes on an international flavor. In addition to a cuisine that is strictly its own, the city boasts of rare and exotic dishes that range from Continental to Polynesian, Cantonese, Armenian and Indian.

For those who are strangers and for some who are not, here is a small selection from among the city's many restaurants—chosen because they are appreciated and loved by residents and remembered by visitors. There are others equally noted and equally well liked but space has limited the list.

For Dining

ALEXIS TANGIER (1200 California, TU 5-6400)—Alexis' menu says "we proudly present our own selection of exotic viands from the land of the magic carpet and romantic continent." In our opinion Alexis has not exaggerated. The setting, though small, is intimate, and all is in keeping with either Zakouska a la Russe or Turkish Pakhlava. A gourmet's wine list.

ALFRED'S (886 Broadway, SU 1-7058) —Famous for well-cured beef of which tons and tons are served weekly. This is the place for a green salad with wine vinegar and olive oil dressing, a broiled filet mignon, a bottle of good red wine and a dessert of cheese and coffee. Popular and sometimes crowded.

ALLOUETTE (1121 Polk, GR 4-2166) —A typically San Franciscan French restaurant where eating and drinking are a fine art to be enjoyed to the fullest. Here cooking with wine is at its very best. Try coq au vin with a fine wine from the well stocked cellars or close your eyes and pick anything on the menu.

BLUE FOX (659 Merchant, YU 6-1727)—Bon vivants claim that the best chefs in town rule the Blue Fox kitchens and few will argue the point. Basically Italian with superb salad dressings and sauces. The pastas—lasagna, Tortellini and gnocchi would titillate the taste of any queen. Any of the specialties of the house is certain to please.

ERNIE'S (847 Montgomery St., EX 2-8860)—Ernie's states "Elegant dining in old San Francisco". An appropriate statement for the Victorian red plush and gilded mirror atmosphere, continental menu and service.

FISHERMAN'S WHARF—Here you must certainly go to see the steaming crab pots, the colorful fishing boats and to sample a crab cocktail if nothing else.

There are restaurants of every degree of elegance. If you're hungry, try the spaghetti with crab meat, fisherman style.

FLEUR DE LYS (777 Sutter, OR 3-7779)—San Francisco's newest. Delicious French cuisine, with specialties marked with a "Fleur de Lys". You will have a wide selection of rare wines and the service is excellent. Bar and lounge open at 5:30, reservations suggested. Parking attendant. Closed Sun. and Mon.

GRISON'S STEAK & CHOP HOUSE (Van Ness & Pacific, OR 3-1888)—The name spells out the menu (except for mountain trout). A fine formula for eating and service has been perfected here. The salad dressing is well worth taking home and the lemon chiffon pie worth a trip to San Francisco. Across the street is another branch of Grison's—the Chicken House, specializing in fried chicken or roast beef to the accompaniment of hot biscuits and honey—m'm'mm'm.

HOUSE OF INDIA (629 Washington, EX 2-0744)—Small, intimate and authentic, this is one of SF's outstanding foreign restaurants. They serve gimlets made exactly right and Pimm's Cups of all kinds. The curries are strictly Calcutta and the beefsteak and kidney pie very British.

JACK'S (615 Sacramento, GA 1-9854) —Typical old San Francisco (1864) and a haunt of the discriminating. Comparable to Gallatoire's in New Orleans for fine food, drink and service. Try any one of half a dozen chicken dishes, clams gourmet and fresh fruit for dessert.

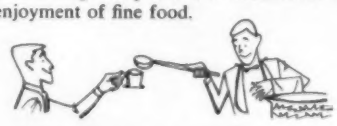
LeBOEUF (545 Washington, GA 1-2914)—If steak is your choice, this is the place. Pick the steak you want and have it cut to order. You pay accordingly.

CHEZ MARGUERITE'S (2330 Taylor St., PR 5-9785)—Our idea of what a French restaurant should be—perfect food, service and atmosphere. Limited in size, small bar, closed Monday and Tuesday, open 6 to 10 P.M. But don't be deterred, the cuisine will reward you.

MONROE'S RESTAURANT (1968 Lombard, JO 7-4550)—Small and intimate. The menu consists of elegant and unusual dishes, but is moderately priced. Because of the size reservations are a must. Closed Mon. and Tues.

NEW JOE'S (540 Broadway, EX 2-9979)—Decorated in homage to the grape, the catalyst of good Italian dining, New Joe's has a chef with a way with everything from a hamburger on toasted French bread to chicken cacciatora. End result is an epicurean masterpiece. Trouble is that everybody who is anybody knows this. But the fine food is worth waiting for anytime.

OWL 'N TURTLE (615 Washington St., EX 7-0335)—Another of San Francisco's newer restaurants. Unusual decor plus a huge fireplace lend themselves to enjoyment of fine food.



PAOLI'S (347 Montgomery, SU 1-7115)—Located in the financial district where the psychological effect of fine food has never been underestimated, Paoli's serves the world famous Pisco Punch, as nearly as it can be concocted (because the true recipe died with Duncan Nicol). The table d'hote dinner with roast beef or chicken Raphael Weill is something long to remember.

PARIS LOUVRE (808 Pacific, GA 1-5157)—Credited with serving the best French food in the city probably because three French chefs own it. Adolf will aperitif you at the bar with his blue-ribbon-winning Gourmet Cocktail. Choose any of the French or continental dishes and top all off with a flaming dessert and cafe diablo.

PIRO'S (714 Montgomery, YU 2-3921) – Comparatively new, hence opulent decor and food in keeping with the atmosphere and elegance. Caesar salad, beef grenadine or rack of lamb (cooked to order for two) are suggested from a menu rich in good things.

PLACE PIGALLE (3721 Buchanan, WE 1-6997)—near the Marina Green, another fine sample of San Francisco's famous French cuisine. A touch of old Paree far from the Continent with French and Gypsy music for your dining pleasure.

ROMANOFF'S (Nob Hill, Huntington Hotel, OR 3-1626)—Place four gold stars on Romanoff's; put on your best bib & tucker; pad the expense account, and prepare to enter the essence of elegance. Royalty in dining is here! With foyer of gold, walls of silk, coats of arms, crowns and regal staircase, Decorator Dudley Kelly dazzles us into the world of royalty. Operated by Prince Romanoff of Beverly Hills.

SCHROEDER'S (240 Front St., GA 1-4778)—To contemporary San Franciscans there has always been a Schroeder's where no women are allowed for lunch, where draught beer comes in beakers and if the food isn't German, it isn't chalked on the big blackboard, which is the only menu.

SHANGHAI LIL (1020 Kearny, SU 1-3400) – To those who know authentic Chinese cooking or who can discuss the menu in native tongue with the waiter, Shanghai Lil's may not be what you are seeking. But for quiet atmosphere and consistently delicious Cantonese cooking, it has no rivals.

SKIPPER KENT'S (1040 Columbus, PR 6-3737) – Owned by a fabled Twentieth Century buccaneer who has sailed the seven seas in three different legendary ships, this house is filled with Polynesian and Oriental treasures. Here is real "atmosphere" in subtly pleasant doses and the same applies to the food and drink. The curries are superb, the rum drinks sublime and the service magnificent.

THE SHADOWS (1349 Montgomery St., EX 2-9823)—Owned by an expatriate Austrian, this showplace sits astride Telegraph Hill with a sweeping view of the Bay, the SF-Oakland bridge and Yerba Buena Island. Cuisine is German and they love to feed you sauerbratten and potato pancakes or smoked loin of pork and sauerkraut with thick split pea soup for a starter. The Shadows pudding, swimming in a wine sauce, is a house specialty, as is Munich beer.

TAD'S STEAK HOUSE (120 Powell, GA 1-9513)—San Francisco's most inexpensive steak house featuring New York cut steak, salad and baked potato.

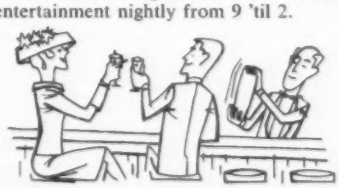
TOKYO SUKIYAKI (225 Jefferson [Fisherman's Wharf] PR 5-9030) – If you've never been to Japan, don't despair. This authentic Japanese restaurant is an exciting experience. The private dining rooms, the decorations of museum quality, the Geisha girls who prepare and serve the food, the background music—but why go on, it's a must. Don't miss going the one floor in the elevator—the doorman is worth the price of dinner.

TRADER VIC'S (20 Cosmo Place, PR 6-2232)—Rightfully listed as one of three great eating places in the U. S. In a Polynesian atmosphere and leisurely Oriental manner you can imbibe ecstatic rum drinks and eat Chinese, Polynesian or just plain American food. Gourmets take their wild ducks here to be broiled in the huge Chinese ovens right before their eyes.

VANESSI'S (498 Broadway, GA 1-0890)—San Francisco's cuisine is permeated with Italian seasoning and this is the dean of the Italian restaurants. One may sit at a curving counter and watch chefs concoct veal scallopini or zabaglione – a fabulous dessert of eggs, sugar and Marsala wine. Or you may direct the cut of your own steak or even mix your own salad. It's a favorite eating place for visiting celebrities.

For Dinner and Dancing, or Just for a Drink and the Show

BACKSTAGE (Bay St. at Mason, TU 5-1344). Nothing else like it anywhere! Cocktails at the Footlight Bar from 5. Unusual and exciting "behind the scenes" entertainment nightly from 9 'til 2.



SIR FRANCIS DRAKE (Sutter & Powell, EX 2-7755). Home of the Starlite Roof, featuring dancing "among the stars" to the music of the Hawaiian Starlighters. Cocktails and buffet luncheon with a spectacular of San Francisco and the Bay area. Open 11 am to 1 am. Closed Sunday.

TOP OF THE MARK (Mark Hopkins Hotel, California & Mason, EX 2-3434). Nob Hill's greatest. You haven't really seen San Francisco and the Bay Area until you've visited the famed cocktail lounge. The view from its large windows is world renowned, revealing a breath-taking panorama of the city and its environs.

BIMBO'S 365 CLUB (1025 Columbus, GR 4-0365)—Noted across the nation for "The Girl (nude and alive) in the Fish Bowl," its spacious bars and its good food. Bimbo's is tops for entertainment, dancing and all-out fun.

HOTEL CANTERBURY (750 Sutter, GR 4-6464)—This newly redecorated hotel features San Francisco's only "side-walk cafe" Champs Elysee style with outdoor dining in a charming garden. Wed. thru Sat. evenings there is music for your dining and dancing pleasure from 6-10.

LOCHINVAR ROOM (Mark Hopkins Hotel, EX 2-3434)—No floor show, but a delightful dinner and supper dancing room atop Nob Hill.

SABELLA'S CAPRI ROOM (2768 Taylor [Fisherman's Wharf] GR 4-8770) – A pleasant dining-dancing, spacious establishment serving the same excellent and reasonable dinners as the downstairs restaurant. Intricately paneled walls, view windows and charming cocktail lounge with huge fireplace, make it good evening's fun—dancing from 9 p.m.

SINALOA (1416 Powell, SU 1-9624)—The dining is very good Mexican and the dancing is on a pocket-handkerchief-sized floor. Here the show is the thing, with torrid Mexican dancers and haunting Mexican songs.

VENETIAN ROOM (Fairmount Hotel, DO 2-8800)—Show, food and service fully justify the expense of an evening spent in this lushly decorated spot.

For Lunch

For San Francisco's businessmen lunch hour is 12:15; for its women anytime after 1 will do. Depending on your particular interest, consider this list of appealing places:

EL PRADO (Plaza Hotel, SU 1-7200)—Noted for delicious large salads, fine prime rib roasts and a chicken dish sauteed with gin and fine seasonings served from copperheaded carts at your table.

FRANCISCAN (Fisherman's Wharf, DO 2-7733)—A recent addition to Fisherman's Wharf. Every table has a view of both the Bay and the city itself. All types of seafood recommended. Crowded Friday nights.

IRON HORSE (19 Maiden Lane, DO 2-1349)—An excellent and popular lunch and dinner spot, taking its name from the head of an iron horse hung over the entry – hitching posts line the sidewalk. Also popular just for cocktails.

MURAL ROOM (St. Francis Hotel, YU 6-2131) – Each Monday San Francisco's social register set meets here to see and be seen. For a glimpse of the city's best dressed and most beautiful women, it's the Mural Room on Monday. (Eggs Benedict if you insist on food).

PALM COURT (Palace Hotel, EX 2-8600)—Once the carriage entrance of this noted hostelry, this spacious, elegant gardenlike room is one of the city's finest lunch places. Recommended—a cocktail, a salad with Green Goddess dressing and a selection from the large pastry table.

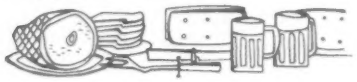
PANELLI'S (453 Pine, DO 2-7198) – Catering to the financial district trade and serving delicious crisp salads and a variety of subtly seasoned entrees. Well stocked bar and knowing waiters.

RITZ OLD POODLE DOG (65 Post, EX 2-9958)—Since 1849 there has been a Poodle Dog restaurant owned by a French family. Now newly redecorated in Victorian elegance, its fine food and excellent

service equal San Francisco dining at its best.

TOMMY'S JOYNT (1023 Van Ness, TU 5-9877) – A lusty saloon for those lovers of tap beer, ham and cheese on rye, salami sandwiches and kosher dishes.

Good food well served in these additional favorites of native San Franciscans: **Redwood Room,** (Clift Hotel); **La Torre's Henry's Fashion Grill** and **Normandy Lane,** (City of Paris).



After 10 O'clock

Along about the shank of the evening for fun, for a drink or just for the hell of it here are some spots that are typically San Franciscan:

EASY STREET (2215 Powell, YU 2-9119)–if you like jazz, this is one of San Francisco's best. Kid Ory, Turk Murphy and others will play your favorite Dixieland nightly except Mondays. No cover charge but a small minimum.

HUNGRY i (599 Jackson, YU 2-6470) – Run by an explosive Italian named Enrico and his White Russian wife. Superb entertainment, food and drink.

PURPLE ONION (140 Columbus, SU 1-0835) – Arty atmosphere where only champagne, wines and beer are sold and the avant garde lingers to expound between shows.

OPUS 1 (141 Columbus, SU 1-5526) – New club with a new idea–hi-fi classical recordings and "live" shows while sipping wine or beer.

BOCCE BALL (622 Broadway, SU 1-9507)–Go through the bar and out the back to watch the experts at this bowling game of tense moments and Italian expressions. Return to the main room to sip a drink and listen to operatic arias sung by SF's leading voices.

BUENA VISTA CAFE (2765 Hyde, GR 4-5044) – An old haunt with a new idea–delicious Irish coffee and imported beers, with enough Bay view to invite lingering.

EL MATADOR (492 Broadway, GA 1-3348)–Quiet, intimate, this museum of tauromachy is owned by Barnaby Conrad, author and bull fighter who studied under Spain's great matador, Belmonte.

FACKS II (960 Bush, PR 6-6360)–One of San Francisco's newest clubs with top name entertainment. Three shows on week nights, four on weekends. Dancing between shows to Sal Carson and his orchestra from 8:30. Small door charge and minimum. Free parking. Call for weekend reservations. Closed Tuesdays.

PAPAGAYO ROOM (Fairmount Hotel) – Popular supper spot where cafe society meets cafe society; Mexican food is the menu feature; the bird city an attraction and Al Williams, the host, a legend.

PALACE CORNER (Palace Hotel)–In the Palace tradition of fine settings and quiet charm, the Corner is fun for a drink and dancing.

FINOCCHIO CLUB (506 Broadway, DO 2-9913)–The City's oldest female impersonator show.

GAY NINETIES (345 Broadway, SU 1-1899) – Ray and Bea Goman produce heroine and villain type skits and community singing.

FORBIDDEN CITY (363 Sutter, DO 2-8648)–All Chinese floor show.

CLUB HANGOVER (729 Bush, GA 1-0743) closed Sundays. The Dixieland Jazz capitol of the West. Earl "Fatha" Hines and his All Stars. Hines is one of the classic jazzmen and a major influence on jazz today. His group is a gathering of great stars from the best bands in the country and features the sensational Muggsy Spanier, who is rated with Louis Armstrong as one of the two greatest jazz coronetists in the business. Also, famous recording star Joe Sullivan. No door or cover charge.

BLACKHAWK (200 Hyde St., GR 4-9567) open every night from 6 to 2. "The Carnegie Hall of Jazz" spotlighting leading stars of the jazz world.

BLACK SHEEP (645 Geary St., PR 5-7611). Mike LaGrand's intimate theatre-Club presenting all-girl shows nightly. Open daily. Cocktails from 4 p.m. First show at 9 p.m. No cover or admission charge.

Out-of-Town

Should you wander away from San Francisco's seven-by-seven mile area, may good fortune see you to any of the following:

ALTA MIRA (126 Harrison Ave., Sausalito, ED 2-1350)–A new deck porch adorns this Sausalito hillside hotel which features oudoor dining and a San Francisco Bay view.

ONDINE (558 Bridgeway, Sausalito, ED 2-0791)–Across the Golden Gate to Sausalito's newest and most sophisticated restaurant. It's perched on a dock overlooking the Bay and San Francisco. The food and service are very good with one of the specialties being Roast Duckling. Reservations suggested.

Andre's L'Omelette–best Martinis "Down the Peninsula" but only one of a dozen great restaurants in the area between SF and Palo Alto.

Berkeley's Claremont Hotel cocktail lounge in late afternoon to watch the sun set behind San Francisco's fabled hills and the Golden Gate . . .

Jack London Square at the foot of Broadway in Oakland where midst modern decor stands the shack, **First and Last Chance Saloon,** a haunt of the great author. . . . **Sam's** in Tiburon to sit at tables on the flower-bedecked pier and watch the sailboats dock as the lights come on street-by-street in San Francisco across the bay. . . . **Estrada's Spanish Kitchen** in Daly City for the best Spanish food in the Bay area. . . . **Down the Peninsula** to enjoy famous restaurants such as **Villa Chartier's Lanai Room, Rickey's Studio Inn, Scotty Campbell's Pioneer Inn** and ever so many others.

In Brief

There are in San Francisco a number of famous, historic and highly popular restaurants which have not been listed elsewhere in this guide. They need no introduction and are set down here for your convenience:

Omar Khayyam's (196 O'Farrell, SU 1-1010)–George Mardikian's world-famous Armenian restaurant.

Amelio Cafe (1630 Powell, SU 1-9643) – Its guest books have been signed by many of the world's greats.

Di Maggio's (Fisherman's Wharf, OR 3-2266)–The Yankee Clipper's very own.

Cathay House (718 California, YU 2-3388)–The tourist attraction of San Francisco's Chinatown.

Camille Restaurant (447 Pine, SU 1-9600) – Long a name and a tradition among San Francisco's eating houses.

Julius Castle (302 Greenwich, DO 2-3042)–Full course French dinners while perched on the side of Telegraph Hill overlooking the Bay.

Sears Fine Foods (529 Powell, DO 2-9938) – For their famous 18 little pancakes for breakfast–the recipe a guarded secret.

Wines

San Franciscans consume more wine per capita than folks in any other major U.S. city. Perhaps it is because good food and good wine go together. Or it could be because California's art of vine-growing and wine-making dates back to the Missions and the padres. It was in the 50's that the great family vineyards and wineries were established that today assure native wines that the discriminating gourmet will find the equal of any produced in Europe.

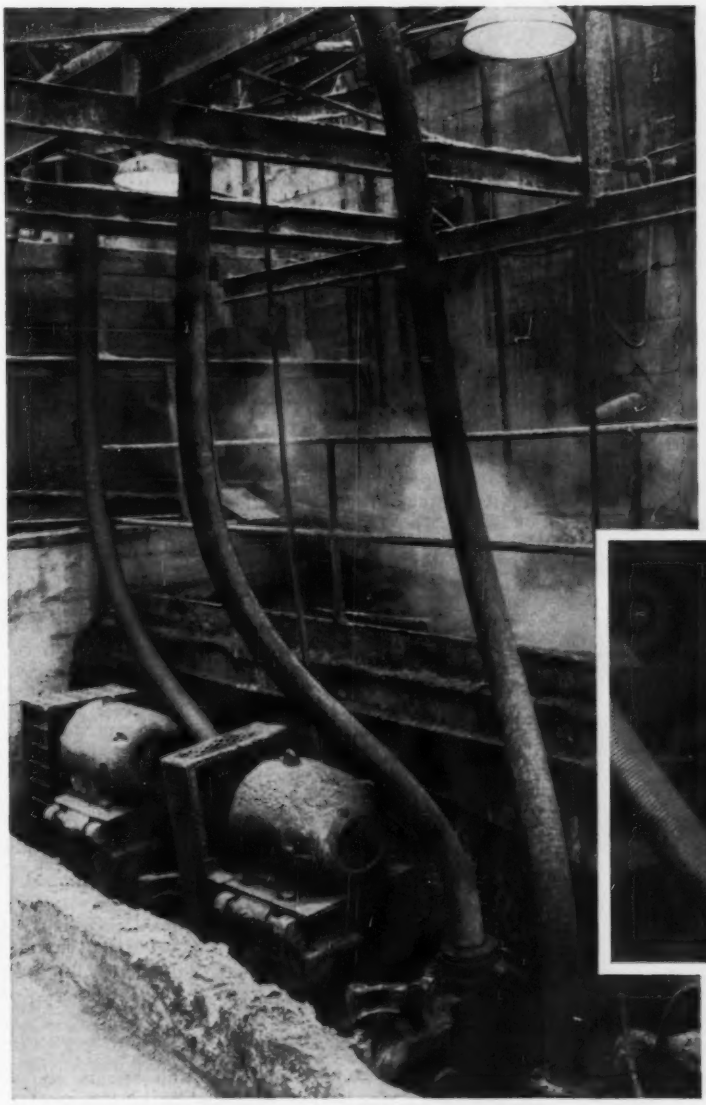
California wines are largerly varietal–named for the principal grape variety from which the wine is made. Examples are Pinot Noir, Gamay and Isabella (Burgundy types); Cabernet and Zinfandel (claret types); Semillon and Sauvignon (sauterne types); and Traminer, Riesling and Sylvaner (Rhine wine types).

Some of the vintners whose wines are prized by connoisseurs are Wente Bros., Concannon and Louis Martini for whites and Beaulieu, Krug, Beringer, Inglenook and Fountaingrove for the reds. An all-purpose wine of great popularity is vin rose–the delicate pink wine which goes with nearly every dish. There are two varieties – Almaden Grenache Rose and Martini Gamay Rose. The notable California champagnes are Paul Masson, Almaden and Korbel.

US RUBBER PILOT PIPE

Abrasion in piping?

Here's how a big uranium mill solved it with "U.S." flexible rubber pipe



• Four 8" U. S. Pilot Pipes carry fine screened ore from secondary crusher storage bins. Four more pipes feed too-coarsely crushed aggregate onto a conveyor belt and back into the crusher. On both jobs, Pilot Pipe has lasted over 4 years.

• In this severe service, quenched calcined ore pulp —50% solid—is pumped through these lengths of U. S. Pilot Pipe, from the roaster calcine pumps.

Where to get flexible piping that can stand up to severe abrasion without being chewed up?

Union Carbide's Uravan mill found the answer in U. S. Pilot® Pipe and Pinch Valves. In addition to the operations pictured above, these products handle the slurry on the 9 separate pumping stations of the counter-current decantation wash circuit, are used on the 2 booster stations between leach and tailings disposal plants and between the primary acid leach and roaster.

This pipe is specially built to handle abrasive materials, such as calcined ore, *and corrosive* materials, such as solutions containing sulfuric and hydrochloric acids. It is flexible, easy to install and won't build up. Its service life is longer than that of metal pipe.

• • •

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

"Visit Booth 505 AMC"

US RUBBER

Mechanical Goods Division

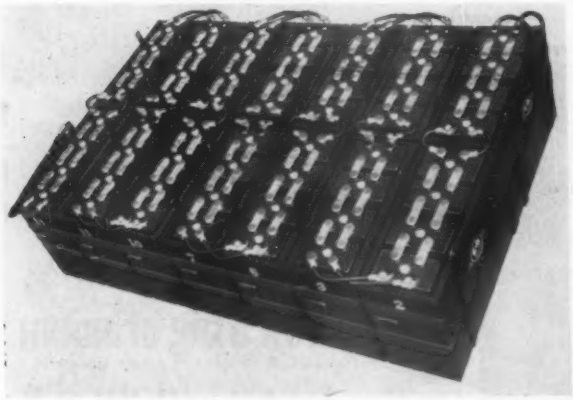
United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

AUXILIARY EQUIPMENT (*Continued from p 112*)

Motive & Stationary Batteries



C&D Batteries, Inc. Two new high-capacity "Sylver-Clad" mining batteries and motive power batteries will be on display. The Type MHC mining battery, shown above, provides 72 amp-hr per positive plate on delivery. Type HC is a motive power battery which also provides 72 amp-hr per positive plate on delivery. Also exhibited will be the "PlastiCell" and "PlastiCal" stationary long-life batteries for control, switchgear and auxiliary power applications. Booth No. 1211.

Hoses and Accessories

Thomas Flexible Coupling Co. will show their line of heavy duty flexible couplings "especially suitable for tough applications such as crusher drives, ball- or rod mill drives, etc. When installed on pumps or turbines, they lengthen the life of the bearings and glands and reduce maintenance on these items."

Thomas states that there are no wearing parts on their couplings—all parts are solidly bolted together. Booth No. 960.

Aeroquip Corp.'s Western Division will display low, medium and high-pressure hoses and self-sealing couplings for virtually all types of fluid-carrying applications. Aeroquip truck air-brake hose and segmented fittings have been designed for tractor-to-trailer lines and axle chamber lines on tractors, trucks and other earthmoving equipment. These fittings make it unnecessary to maintain large stocks of ready-made assemblies. Booth No. 1124.

Band-It Co. A complete line of accessories for air and water hose will be on display in this 32-ft exhibit, including Band-it stainless steel brackets and clamps, standard bands and buckles, hose fittings, hose nipples, air-operated clamp removers and clamping tools, hose nipple pushers, and sign brackets. General Catalog B-5 lists the complete line of the company. Booth No. 940.

Extra Safe Cable

Plastic Wire & Cable Corp., Jewett City, Conn., will highlight the parallel Type W and Type G trailing cables, which are flame- and damage-resistant, at the Show. The cables, says PWC, cannot continue to burn after the fault arc has been cleared, and they provide extraordinary safe service life under severe physical abuse. Booth No. 1125 .

Dust Collector Principles

Wheelabrator Corp. will feature a cutaway model of one of their dust collectors that "will thoroughly illustrate the operating principles of these collectors and the various types and weights of cloth Dustubes that can be used, depending upon the temperature and the nature of the dust or fume particles being collected."

In addition, Wheelabrator will show a small operating Ultra-Filtration dust collector, which they say is a standard cloth-type collector specially treated with a filter aid that will enable it to function very efficiently.

According to a company statement, Ultra-Filtration cuts costs by protecting valuable electrical equipment against dust-laden air. "Ultra-Filtration units are reasonably priced, easy to maintain, and will remove over 99% of all the impurities contained in normal atmospheric air." Booth No. 1430.

Hardened for Long Life

Tool Steel Gear & Pinion Co. Cutaway samples of various products to show depth of hardening to full permissible wear life. Photographs and actual products will complete the display.

Equipment in metal mining is subject to severe service and wear. According to a company release, Tool Steel Gear & Pinion special hardened parts are guaranteed to prolong their life as compared with ordinary material. Booth No. 1710.

Holding the Back

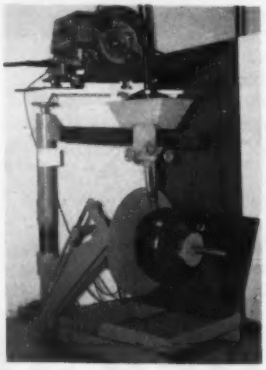
Bethlehem Pacific Coast Steel Corp. told American Mining Congress that their exhibit will be in Booth No. 322 with a replica of a mine interior showing how yieldable arches and mine bolts can do a superior job in holding the back. New K-type shell roof bolts will be on display as will Bethlehem's mining rope and drill steel. Visitors selecting high-grade ore samples from mine cars loaded with uranium will be rewarded for their good judgment. Booth No. 322.

For Wear Resistance

International Nickel Co., Inc. will illustrate the company's contribution to technological progress in the mining and extractive metallurgy fields; its provisions for university scholarships in mining, metallurgy and geology; and its other activities (motion pictures) toward education.

In the booth layout will be material indicating the advantages of nickel-containing alloys—Ni-Hard grinding mill liners, abrasion resistant applications, and the new Type 3 Ni-Hard for toughness plus wear resistance. In addition, there will be details on the new Inco-Hard "1" electrodes for hard-surfacing and important uses of nickel-alloy stainless steels in process metallurgy. Booth No. 622.

Gates Rubber Co. will illustrate how Vulcoline Cold Bond rubber, rubber-faced steel plate and other abrasive and corrosion resistant rubber products eliminate rapid wear from abrasion or impact damage—saves not only material and installation costs, but also reduces downtime and maintenance. Booth No. 1440.



Stoody Co. will operate an automatic electric welding machine, which will, in turn, rebuild worn mining equipment. In addition, there'll be semi-automatic welders, both open and submerged arc operations, hardfacing mining equipment; display of hardfaced mine machinery and parts.

Stoody announcements claim that rebuilding and hardfacing with their alloys help restore many pieces of equipment that otherwise would be scrapped. Booth No. 1240.

Kennametal Inc. will display new hardfacing materials of tungsten carbide that can multiply the service life of many machine parts. See Booth No. 200.

JENKINS

O.S.&Y. U-BOLT GATE

MADE BETTER THAN NEED BE . . .

Costs Less to Use

YOU PAY NO MORE for the extra quality you see in every part of a Jenkins Outside Screw & Yoke U-Bolt Gate valve. Yet longer life and reduced maintenance is bound to result from the extra ruggedness, the precision manufacture and unique design features which Jenkins puts into these popular, general utility valves.

Choose the Outside Screw & Yoke pattern for services where spindle threads must be kept out of the destructive effects of fluids in the line; where spindle threads must be cleaned and lubricated regularly or where a rising spindle is needed to indicate wedge position.

Choose JENKINS, whether O.S. & Y. or Inside Screw pattern, for valves built to save maintenance dollars.

WIDE RANGE OF JENKINS U-BOLT GATES

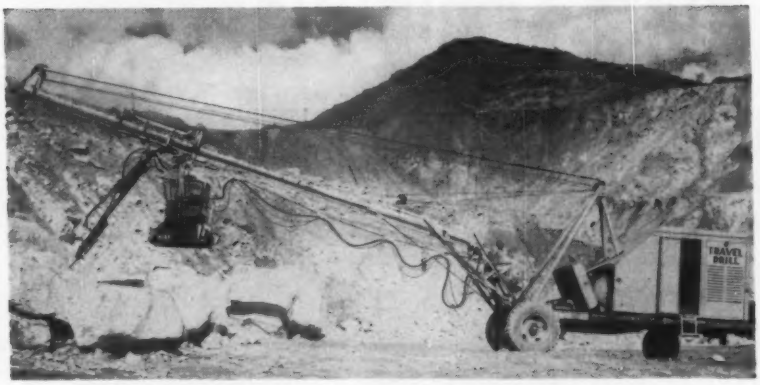
GET FOLDER NO. 207 which describes Inside Screw and O.S. & Y. patterns . . . Iron Body with Bronze or Stainless Steel Mounting . . . All-Iron and Ni-Resist with type 316 Stainless Steel trim. Ask your local Jenkins Distributor or write Jenkins Bros., 100 Park Avenue, New York 17.

Fig. 242
Iron Body, Bronze Mounted

JENKINS
LOOK FOR THE JENKINS DIAMOND
VALVES
JENKINS SINCE 1864 Jenkins Bros.

Sold Through Leading Distributors Everywhere

OPERATING IDEAS



New Drill Unit Is Fast And Safe

A DRILLING INNOVATION has reduced accidents at the Lavender pit of Phelps Dodge Corp., Copper Queen Branch, Bisbee, Ariz., by eliminating the need for drill operators climbing muckpiles, slipping off boulders, or having feet injured by broken drill steel. At the same time, it has greatly increased drill footage per manshift.

The new device (Travel Drill), consists of a self-contained mobile unit mounted on two front drive wheels with 1200x24 tires and one dolly or caster rear steering wheel with 1000x15 tire. Compressed air for the drills, drive, and other control mechanisms is furnished by a 230-cfm compresser driven by a diesel engine through a V-belt drive. A small air-driven hydraulic pump with accumulator and control valves moves the rock drill and a cylindrical tank supplies water for wet drilling.

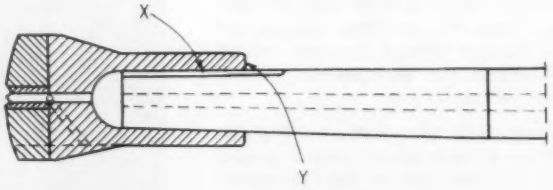
Unit's control cab hangs below the trolley to which is pivoted the 3-in. automatic drifter with a 4-ft feed screw. Both trolley and cab ride under a 40-ft tubular boom. Drilling muckpile boulders or 30-ft embankment brows is possible by running the carriage up the boom, raising the boom, or by hydraulically elevating the end of the drill. Horizontal spotting is done by two small hydraulic cylinders which swing the drill through 104 deg, or by turning the entire rig by the rear steering dolly wheel.

One man carries out all operations from the elevated cab. He seldom has to leave it after starting the engine and is well above the ground and not directly exposed to the hazards from rough muckpiles and embankments.

Side Flush Outlets Remove Chips

GROOVES IN THE CONICAL SURFACE of drill rod (x) used with slip-on taper socket bits keep chips from collecting at bit-rod junction (y) during drilling operations.

In addition, both rod and bit are more effectively cooled, preventing bit freeze.—From the German magazine, *Erzmetall*.



Controls Curb Copper Sloshing

BY HAVING a Westinghouse Magamp system installed on a 1200 rpm motor geared down to 0.24 rpm, a loaded wheel 25 ft in dia and weighing 25 tons was accelerated from zero to "top speed" in 10 to 25 sec, without, according to Westinghouse, any jerking in stopping or starting. These figures were obtained on a large wheel containing molds used to form copper anodes at Inspiration Consolidated Copper Co., Inspiration, Ariz.

During the casting operations, all starting and stopping had to be smooth—jerking would ruin the cooling copper's crystal structure and hamper the electrolytic processes.

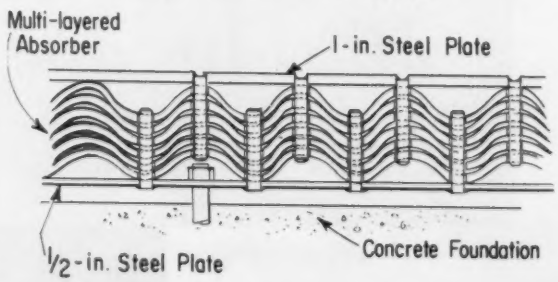
A Westinghouse release said that "in the control cycle, the wheel runs at 0.24 rpm after accelerating until a limit switch initiates the slowdown and takes about 10 to 25 sec to decelerate to 0.024 rpm. The wheel runs at this slow speed until another limit switch applies a suicide field to the generator to bring the wheel to a complete stop."

Layered Absorber Saves Concrete

A NEW TYPE SHOCK ABSORBER has greatly reduced the damage done by taconite falling on concrete surrounding a primary crusher hopper at Erie Mining Co., Aurora, Minn.

The unit, designed by Anaconda Engineering Co., N.Y.C., consists of 12 assemblies of Armco plates normally used for large diameter culverts. (Armco Drainage & Metal Products, Inc.).

Fitted between a ½-in. plate on the bottom and a 1-in. plate on top, the device, according to Armco, absorbs the impact of falling ore much the same as a box mattress.



LARGE DIAMETER

DENVER TURBINE PROPELLER AGITATORS

It Is Now Possible to Have Effective Propeller Agitation in Tanks as Large as 40' Diameter

Design of DENVER turbine type propeller makes possible large diameter propeller agitators for agitating large volumes of pulp in large tanks. One large diameter agitator handles volume of several small ones—saves space, operating expense, supervision, maintenance.

- Large diameter propeller operating at slower speeds gives proper agitation with heavy slurries even as coarse as 10 mesh. Slower speeds mean savings in horsepower and further savings from reduced wear.
- Propeller is designed for long service. Blade wears evenly and uniformly with no cavitation—giving top efficiency throughout propeller's long life.
- Large diameter DENVER propeller eliminates problems often encountered with airlift or rake agitators—cuts need for operating attention, saves on maintenance.
- Available in rubber covered or alloy steel construction.

Find out how large diameter DENVER Turbine Propeller Agitators can save you money—build your profits. Send details of your requirements for careful, detailed recommendation on the correct agitator for your operation.

Leading suppliers of equipment for:

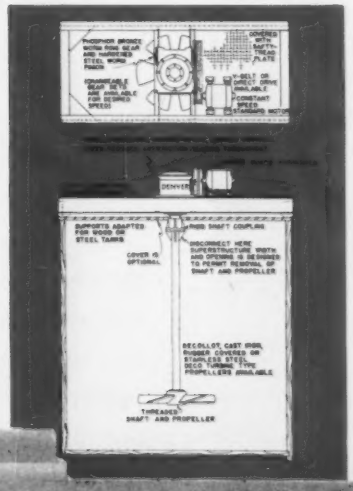
- AGITATION
- PRECIPITATION
- MIXING
- LEACHING
- NEUTRALIZING
- SCRUBBING
- REPULPING
- CONDITIONING
- ADSORPTION
- SOLVENT EXTRACTION

Here is what DENVER Turbine Type Propeller Agitators are doing:

Operation: Leaching Uranium Ore.
Size: 16'x16' tanks—9 units operating 1 plant.
Size Propeller: 60" diameter.
Pulp: —14 mesh, 15% on 35 mesh, 60% solids, 1.0 pH, temperature 80° F.
HP: 11 to 15.
Propeller Wearing Life: 12 mos., still in service

Operation: Leaching Uranium Ore.
Size: 16'x18' tanks—6 units operating 1 plant.
Size Propeller: 60" diameter.
Pulp: —28 mesh, 61% solids, 1.0 pH, temperature 130° F
HP: 11 to 15.
Propeller Wearing Life: 18 months.

Let us tell you about our repeat orders for these large diameter agitators.



The firm that makes no promises happier, healthier and wealthier

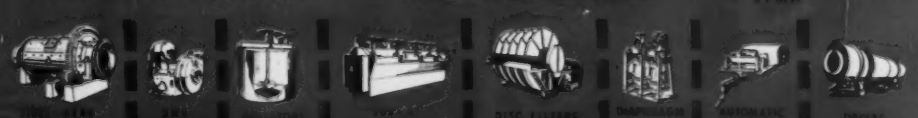
DECO ENGINEERS — DENVER EQUIPMENT 24 HOUR SERVICE COMPANY

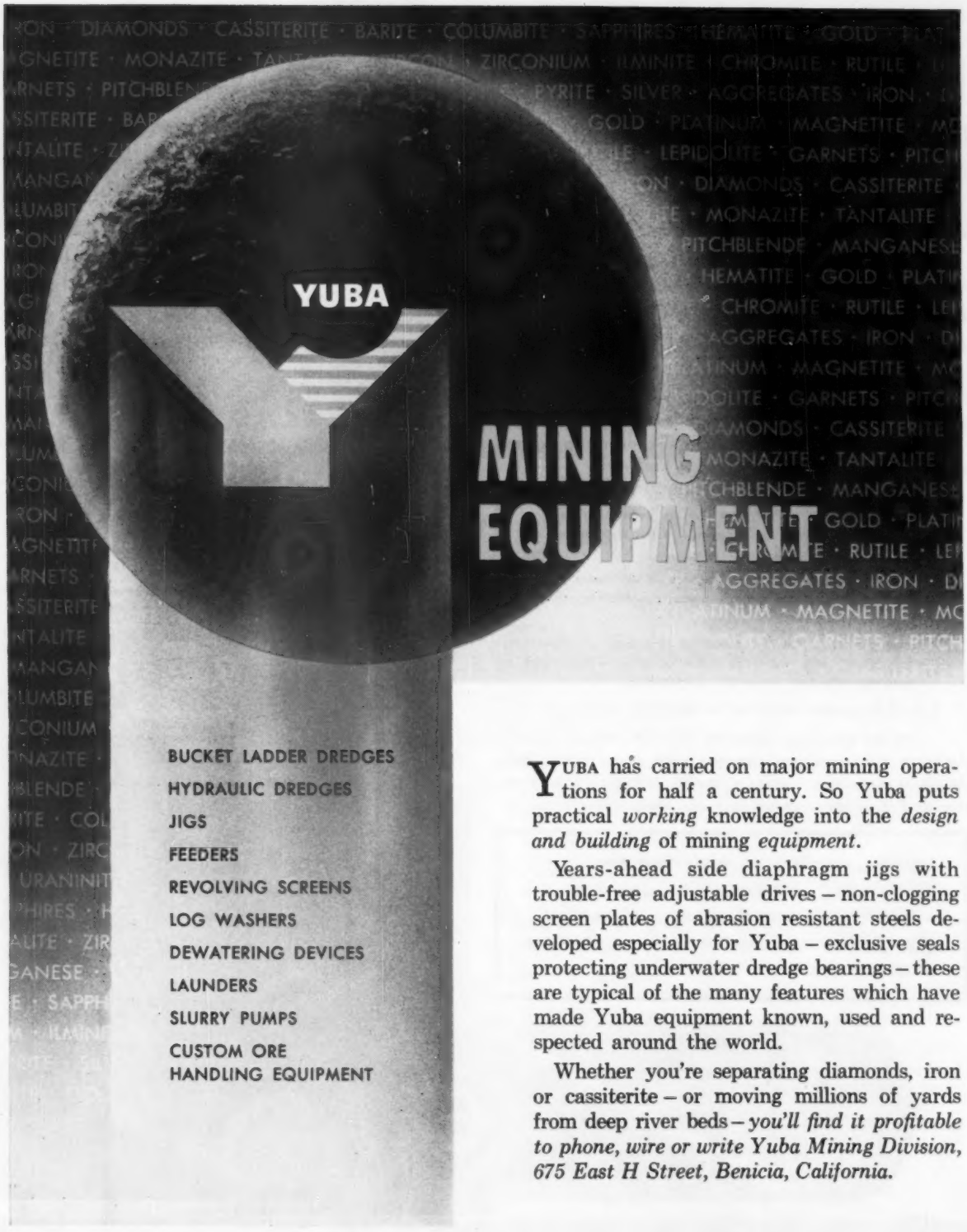
Complete Mill Equipment

DENVER EQUIPMENT COMPANY

1400 Seventeenth St. • Denver 17, Colorado

• DENVER
• NEW YORK
• TORONTO
• VANCOUVER
• MEXICO, D.F.
• LONDON
• JOHANNESBURG
• LIMA





YUBA has carried on major mining operations for half a century. So Yuba puts practical *working* knowledge into the *design and building* of mining *equipment*.

Years-ahead side diaphragm jigs with trouble-free adjustable drives – non-clogging screen plates of abrasion resistant steels developed especially for Yuba – exclusive seals protecting underwater dredge bearings – these are typical of the many features which have made Yuba equipment known, used and respected around the world.

Whether you're separating diamonds, iron or cassiterite – or moving millions of yards from deep river beds – *you'll find it profitable to phone, wire or write Yuba Mining Division, 675 East H Street, Benicia, California.*

YUBA CONSOLIDATED INDUSTRIES, INC.

OPERATING IDEAS *(Continued)*

Track Shifting Plan Cuts Costs

BY FITTING A DOZER BLADE with a heavy, detachable, triangular hook, Phelps Dodge Corp. has simplified its track shifting operations at the Copper Queen branch's Lavender pit, Bisbee, Ariz.

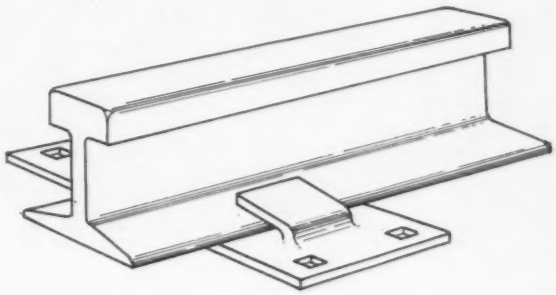
Former shifting method called for scraping away the ballast, moving the track (by track shifter or by lifting with a power jack and shifting with a dozer), changing broken ties, re-spiking and re-ballasting by bulldozing small-size dump material over the track. Then the outside rail was lifted 4-in. to allow for settlement, and again dump material was dozed flush with the top of the rails.

With the new system, here's what happens. The track, now sectionalized in lengths varying from 3 to 10 rails, is first pulled back 20 ft from the original postition by engaging two hooks on the rear or bucket end of the tractor (Traxcavator). After the dozer tractor, equipped with a heavy cable winch, levels the "slug" and grades the edge of the dump to the proper slope with a motor grader, Traxcavator then pushes the track back to the dump edge. In moving the track back, the outside of the rail is either lifted (by a shoe at the end of the detachable hook to clear the ties of the rough surface when using the Traxcavator alone, or by the hook and cable actuated by the dozer winch when employing both units), pushed or pulled a short distance up the slope of the newly graded track bed, and finally pushed into proper position by the Traxcavator. Track sections are then rejoined, and after realignment the track is ready for use without ballast—great savings in both time and costs.

Tie Plate Holds Spike In Place

HERE'S ANOTHER IDEA from the Phelps Dodge Lavender pit. The tie plates used on company track have been made in their own shop and have brought about a 30% savings in ties.

Flange clips are hot punched from ⅜-in. plate and left in a vertical position. After tie plates have been spiked, the clips are bent down over the rail flange with a conventional spike hammer. The tie plate holds the rail to gage and permits sufficient rail movement to materially decrease loosening of spikes when shifting track.



Some Helpful Hints on Repairing Lift Truck Hydraulic Systems

MINOR DAMAGE TO TRUCK HYDRAULIC SYSTEMS can, in many cases, be easily and quickly corrected if maintenance crews know what to look for.

As a handy reference, Elwell-Parker Electric Co., Cleveland, has prepared the following check list:

Problem 1: Low working pressure.

Look for: Worn pump or pump motor, low voltage, loose electrical connection or hose line restriction.

Problem 2: No motion, slow or jerky motion of the elevator or the mast when tilted.

Look for: Weak or broken relief valve, scored relief plunger or seat, worn or broken seal (O-ring), foreign matter, a plunger which does not open all the way, or a sticking plunger.

Also: Check air in lines, worn packing, packing cups or broken packing cup back-up rings.

Remedies: Replace weak or broken parts; lap in relief valve plunger seat with light grinding compound; replace seal; flush entire system; adjust control leakage for equal plunger strokes and replace return spring if broken; remove scores on plunger with medium grade emery cloth dipped in oil; replace spring.

Also: Bleed cylinder by relieving bleeder screw or breaking line coupling screw; with oil at working pressure; or replace worn parts.

Problem 3: Seeping packing gland.

Look for: Worn or damaged packing assembly, damaged auxiliary O-rings.

Remedy: Adjust or replace packing assembly; replace auxiliary O-rings.

Problem 4: Tilt speed of mast is normal on backward movement, but sluggish on forward movement.

Look for: Foreign matter or obstruction at tilt check needle.

Remedy: Back-off needle valve by relieving lock nut; operate tilt; tilt motion both directions; reset check for desired tilt motion lock jam nut.

Problem 5: Holding pressure on attachments drop.

Look for: Foreign matter lodged on valve seat of check valve, worn or pitted plunger check valve seat, weak pressure spring of check valve, worn packings of cylinder, also first factors listed in problem 2.

Remedies: Flush out check valve; lap in seat if badly pitted or replace check valve; replace pressure spring; replace worn packings; also first six factors listed in remedies portion of problem 2.

Problem 6: Load on cylinder will not hold.

Look for: Oil by-passing the valve plunger.

Remedy: This condition can only be corrected by the truck manufacturer by rehoning the plunger bore and replacing the plunger with an oversize valve.

For a complete list, contact Elwell-Parker Electric Co., 4544 St. Clair Ave., Cleveland 3, Ohio.

ONLY CATERPILLAR GIVES YOU

THE OIL

Here is what you should know about its money-saving and operating advantages

How much better is the exclusive Caterpillar oil clutch than the ordinary clutch? It can be summed up in this short statement:

When the Caterpillar oil clutch is ready for *adjustment*, the ordinary clutch is ready for *replacement*. Experience in the field proves it.

In the years since 1954, when Caterpillar introduced this remarkable advance in earthmover power trains, owners all over the country have reported thousands of hours of oil clutch operation free of adjustment or repair.

Typical of these reports is this one from Myron Omernik, land improvement contractor of Custer, Wis.: "Our D7 has operated 5,100 hours without any oil clutch repairs or adjustment."

This performance record means two clear-cut money-saving advantages:

1. Virtual elimination of down time caused by clutch failure.

2. Greatly reduced repair costs.

But in addition to its economy features, the oil clutch also provides superior operation. Here is why:

1. A hydraulic booster on the D9 and D8, operated by clutch oil pump pressure, takes the effort out of clutch operation but retains clutch "feel."

2. Clutch "fade" because of overheating is practically eliminated. The oil in which the clutch parts run is pumped directly from the crankcase. This means the clutch temperature never rises above engine temperature.

3. A clutch brake helps match clutch and transmission speeds—making shifting easier.

Here, in brief, is how the oil clutch works:

Three metallic-faced plates are separated by oil films at all times except for the last revolution or two as the clutch is engaged. Oil enters the inner diameters of the clutch plates and circulates between them by means of grooves in the clutch facings, carrying away heat and reducing wear. All clutch parts are constantly running in oil.

The exclusive Caterpillar oil clutch is not an "extra"—it is *standard equipment* on the D9, D8, D7 and D6 Tractors, all Traxcavators, on the No. 12 Motor Grader and on the MD6 and MD7 Pipelayers. Yet it is an "extra" in *value* that is unmatched in the industry.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

IMPORTANT OIL CLUTCH FEATURES

Independent oil pump assures positive lubrication and cooling for clutch plates, bearings and other vital moving parts.

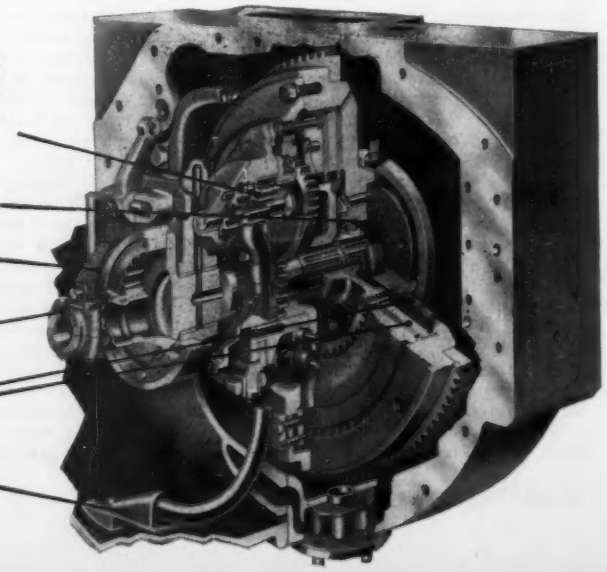
Heavy-duty bearings have extra capacity for long service life.

Clutch brake helps match clutch and transmission speeds—makes shifting easier.

Removable coupling allows clutch to be removed without disturbing engine or transmission.

Double clutch plates are metallic-faced for heavy-duty torque transmission.

Intake screens protect the oil pump from foreign material.



CLUTCH

CAT D9 TRACTOR: "We have operated this Cat D9 Tractor for 4,000 hours in the toughest kind of work without any repairs to the oil clutch," says Frank Hill of the Silva & Hill Construction Co., Los Angeles, California. "I just wouldn't consider buying a tractor without it now."

CAT NO. 955 TRAXCAVATOR: "In over 4,000 hours on our two hard-working No. 955 Traxcavators, we have made only one simple adjustment on an oil clutch and that took only about a half hour. It's much simpler than the old friction-type clutch," says M. J. Lutz of Bethel Park, Pennsylvania.

OWNERS REPORT TROUBLE-FREE OPERATION

CAT NO. 12 MOTOR GRADER: "Our No. 12 is starting its third season without interruption due to clutch trouble." With only one clutch adjustment in over 2,000 hours, Francis Bloomer, President of the John F. Bloomer Co., Appleton, Wisconsin, says, "We like the No. 12 with the oil clutch." This company, with 35 years of road construction work, owns a fleet of Cat-built equipment consisting of No. 12s, D9, D8s, DW21s.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

LEADER IN EARTHMOVING RESEARCH

Developing

HOISTING 19- to 20,000 tons ore per month, Rio de Oro Uranium Mines, Inc. hopes to develop the Dysart No. 1 mine into a 1,000-tpd producer by year end.

DEVELOPMENT calls for staying in the ore and maintaining drifts 15 ft wide by maximum 10 ft high using a burn cut, says Marshall Fletcher, general foreman.

DRILLING is done with Atlas Copco jacklegs (No. 12 steel in 8 and 10 ft lengths). Bits are integral chisel type for 1⅝-in. powder holes in development burn cuts.

RIO DE ORO URANIUM MINES, INC., first in Ambrosia Lake, is rapidly developing the Dysart No. 1, producing development ore at the rate of 19,000 to 20,000 tpm. Mine works two shifts, five days a week under the direction of Ray Schultze, general superintendent.

At Rio de Oro a shift crew consists of surface and engineering help, and 22 men undeground (except for the day shift which has four extra maintenance men) broken down as follows: six drillers, two loader operators, four truck drivers, and 10 ventilation and shop maintenance.

The underground crew is under the direction of Marshall Fletcher, general foreman. Harold Powers is chief engineer and geologist. Total payroll —salary and hourly—is 70 men.

The mine has been under development since late 1955, with five spots currently working, having from 15 to 20 working faces. Mining is horizontal for the most part, staying in the ore in drifts 15 ft wide by 6 to 10 ft high. Little or no waste is hoisted. And, while the uranium beds run to as much as 60 ft in thickness, the height of the drifts is held to a 10 ft maximum.

When in production, all the ore will be broken and, where possible, the secondary and tertiary ore lenses above and below the main channel will be stoped out. The back is quite stable. Only one or two clay backs have had to be timbered. Usual practice is to scale the clay until a sound back is found. Long hole probing is used to explore for ore in all directions in the drift, and to check out the exploration diamond drill hole logs obtained from the surface. The entire orebody has been diamond drilled on about 100 ft centers. Rio's holding cover the SW-¼ of Section 11, McKinley County.

The shift working cycle is to muck out, drill, load and then fire at the end of a shift. Drillers are on a bonus system based on linear foot of advance. Muck handlers get a bonus based on tons hoisted. The rest of underground crew benefits from an indirect bonus rated on one-half of the production bonus of the mining crews.

While no definite final drilling pattern has been established, the presently used method is a burn cut with 30 to 40 holes per round. Atlas experimental No. 222 powder and Pacific Powder Co. sticks are being used. Powder factor is about 1.8 on development work to date. Rio feels that

Rio de Oro

the powder factor will be much lower when development is completed and production mining begins.

Atlas Copco jacklegs with No. 12 drill steel in 8- and 10-ft lengths are used. Bits are integral chisel type for 1⅝ in. powder holes. Underground haulage is by two Caterpillar 933 loaders (one International Harvester TD 6 on standby) and four Getman ore trucks, Model CD 4 with 7-ton capacity. All undergound equipment is U.S. Bureau of Mines approved. All earthmoving equipment is repaired in the underground maintenance shops.

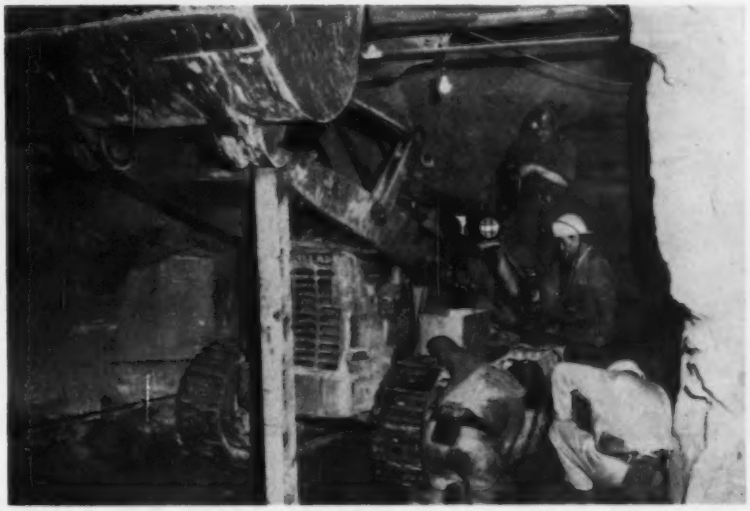
Thanks to its shallow depth, the mine is quite dry—in an area where water in the mine presents a serious, costly mining problem. There is not one single pump in the mine. Roadways are sprayed with water once every week or so to keep down the dust—Radon daughter products tend to cling to the fine particles. Mine ventilation is provided through a Jeffrey's Model 8H, 50hp, 70,000 cfm fan pushing air down a raise from the surface, through the mine, and up the shaft.

Mine power is supplied by a 350 kw Caterpillar D397 diesel generator. Diesel-powered Atlas Copco 700-cfm compressors supply drilling air. The hoist at Rio de Oro is a 75hp Vulcan Iron Works unit with a 2-ton skip under an eight-man cage. Rope speed is 450 fpm. The shaft bottoms at about 350 ft. Ore is hauled in 22-ton trucks to Homestake-New Mexico Partners' new 750-tpd uranium mill 19 miles away. (Rio de Oro is an owner in the mill.) Rio supplies an engineering office and auxiliary equipment on the surface, with a bunkhouse that sleeps 16 to 18 men. The rest of the crew lives in nearby San Mateo or Grants.

According to Rio de Oro president Rodney DeVilliers, Rio will receive 75% of the milling profits from its own ore shipped to HNMP, and participate in the profits from all custom ore milled. The Dysart property contains sufficient ore to justify 700-tpd production for the next 10 years. Present intent is to reach 1,000 tpd before the year ends. In addition to the Dysart property, Rio de Oro has leased a one-square-mile holding from Parador Mining Co. (Ike No.) where considerable ore of higher grade than Dysart is being blocked out.

E&MJ would like to thank Rodney DeVilliers, Ray Schultze and Jere Willis for the many courtesies extended during our recent visit.

PRESENT powder factor during development work is about 1.8. Rio says that the powder factor will drop considerably after the mine reaches 1,000 tpd production.

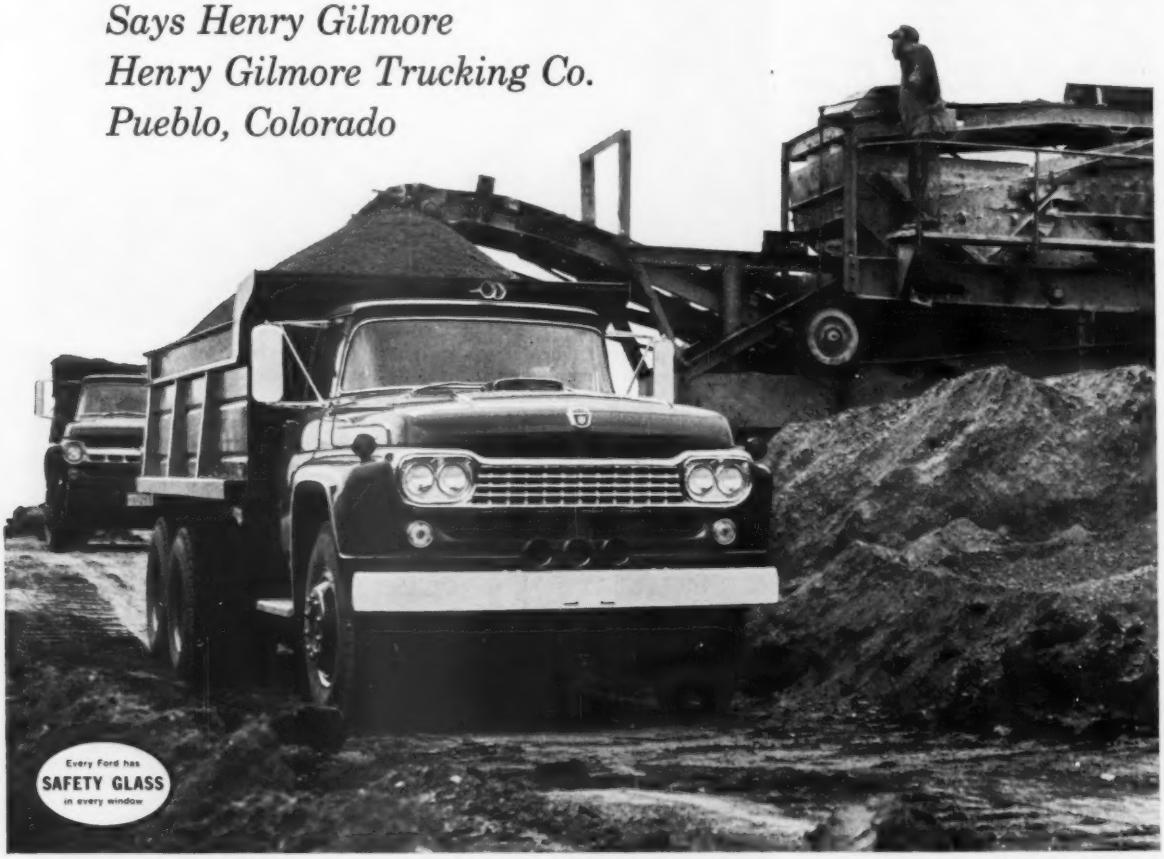


MAINTENANCE work is done underground. Two Caterpillar 933 loaders and four Getman (7-ton) trucks haul ore, with one International-Harvester TD-6 standby.

VISITORS are frequent at Dysart No. 1 in Ambrosia Lake where the uranium industry is investing some $81-million. Ray Schultze is at lower right; Jere Willis, far left.

"FOR ENDURANCE, I KNOW YOU

Says Henry Gilmore
Henry Gilmore Trucking Co.
Pueblo, Colorado



"We've run our Ford trucks over 100,000 miles and have never had any major repairs!

"We've tried all kinds of trucks and our Ford tandems are the best we've ever owned. Our 24 Fords are T-750's and T-800's with 332-cu. in. Heavy Duty V-8 engines. We run 'em an average of 100,000 miles before trading, and never touch the engines except for minor tune-ups.

"Our '58 T-800's have 34,000-lb. tandem axles and carry 10 yards of gravel or hot mix. During the winter months, we hauled in a 30,000-ton mountain of gravel to feed the asphalt plant this spring. Now, we are using the trucks to carry black top from plant to spreaders for highway paving.

"My drivers really like and take exceptional care of their Fords. And power steering is a great driving help and safety factor.

"We like Ford's parts standardization and availability. With some trucks we've owned, it was like sending to a foreign country to get parts. We are completely sold on Ford trucks and have two new T-800 dumps on order. They'll be used on an uranium ore haul from the mountains."

Finance the easy one-stop way! Ask about the new **FORD FLEET TRUCK FINANCE PLAN!**

CAN'T BEAT FORD TRUCKS"

New '58 Ford T-800 dump takes on a 16-ton payload of "hot mix" at Broderick and Gibbons' asphalt plant, and another Ford tandem waits its turn.

Getting to the job quickly is important with the kind of loads carried in the Gilmore trucks. Shown below is one of their big Ford tandems dumping its load into an asphalt spreader.

Bring extra savings to your business . . . make your next truck a FORD!

Ford offers a complete line of over 360 truck models, ranging from pickups to giant tandems. And there are Ford Dealers almost everywhere, ready to help you select the truck best suited for your individual job. They're ready with modern service facilities, trained mechanics and low-priced Ford parts to keep your truck on the job, earning for you.

Ford trucks are your best buy! Ford's initial costs are *low* and resale value is traditionally high. The modern Ford Styleside pickups are the lowest-priced models available with full cab-wide body . . . giving you 23% more loadspace than traditional pickups.

Only Ford offers the economy of Short Stroke power in all engines, Six or V-8. And Ford's Heavy Duty V-8's offer new, advanced durability features. The modern Ford Six, available in Light and Medium Duty F- and P-Series trucks, is equipped with an economy carburetor that gives you up to 10% greater gas mileage. It's plenty peppy, too, with more horsepower per cubic inch than any other six in its class.

Ford's rugged cab and chassis construction means these new '58s are built to last. All this plus the proven fact that Ford trucks last longer adds up to America's No.1 truck value.

See your local Ford Dealer for the latest in '58 trucks or the best in A-1 used trucks.

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . LAST LONGER, TOO!

PERSONALS

Kelley

Linney

W. M. Kelley, president of Reserve Mining Co., has retired from active business, but will continue as a member of the board. **Robert J. Linney,** formerly vice president in charge of operations, was elected executive vice president and a member of the executive committee at a recent company board meeting. **C. M. White,** chairman of the board of directors of Republic Steel Corp. will serve as president of Reserve for the ensuing year. The company announced that the position of chairman of the Reserve board of directors had been abolished and that it plans to have an official of Republic and an official of Armco Steel Corp. alternate each year as president. Member of Reserve's executive committee are: **Ralph L. Gray,** president of Armco, **White** and **Linney.**

Rom Warburton, chief accounting officer for International Smelting & Refining Co., retired June 1 after 40 years' service.

Richard S. Newlin, vice president in charge of operations of the Anaconda Co., has been elected president and director of its subsidiary, Greene Cananea Copper Co. As president, he succeeds Clyde E. Weed.

General Jess Larson, of Washington, D. C., was elected president of the Uranium Institute of America at a special session of the Institute's board of directors. Larson succeeds **General Patrick J. Hurley** of Santa Fe, who was named president emeritus for the organization. **Ed Crabtree,** of Colorado School of Mines, was elected a vice president.

Marshall Sittig, formerly president and managing director of the American Lithium Institute Inc., Princeton, N.J., has joined W. Alec Jordan Associates, New York firm of chemical marketing consultants and technical public relations specialists, as vice president. He is author of more than 40 technical articles on chemical engineering, petroleum refining, and metallurgical developments and is a recognized authority on the chemistry of the alkali metals.

Hiram B. Humphrey, of Menlo Park, Calif., and retired safety expert, was honored recently with the U. S. Department of the Interior's Meritorious Service Award and Silver Medal, in recognition of 28 years of exceptional service in the U. S. Bureau of Mines. He had joined the Bureau as an assistant mining engineer in 1929, retiring in August 1957 as mining health and safety engineer.

Charles W. Pegg resigned from Rio Candian Exploration Ltd. in April to accept a position with the Karl J. Springer interests in Toronto.

Ralph W. Yocum, formerly at Great Lakes Carbon Co.'s diatomaceous plant at Lompoc, Calif., is now superintendent of Eagle-Picher's diatomaceous earth processing plant under construction at Colado.

J. E. Denyer has been appointed a director of Britannia Lead Co. Ltd. and Siamese Tin Syndicate Ltd., and has resigned from Cyanamid of Great Britain Ltd.

Dr. D. R. Derry, J. A. Sadler, J. S. Turnbull, R. Jeanty and **Dr. E. B. Gillanders** were elected directors at Rio Canadian Exploration Ltd.'s annual meeting. Derry, Sadler and Turnbull were appointed president, executive vice president and manager, and secretary-treasurer, respectively.

Frank A. Wardlaw Jr. has been named resident consulting engineer and sales representative in the Rocky Mountain area for Southwestern Engineering Co.'s Engineering and Construction division. Formerly associated with Anaconda Co. and its subsidiaries for more than 24 yr, Wardlaw Jr. latterly served as general manager of mines and smelter operations in the Intermountain area of Western U. S. He has had almost a half-century of experience in mining operations and management since graduation from Columbia University. He is an officer and director of United Park City Mines Co., North Lily Mining Co., Western Rock Bit Co. and is a past president of the Utah Mining Association.

Wardlaw Jr.

Fred A. Brinker was recently appointed assistant vice president of Vanadium Corp. of America. Formerly chief metallurgist, western division, Brinker has also worked since 1951 in an engineering capacity; from 1944 to 1951 he was manager of Highland Mary Mines.

E. C. Weichel Jr. and **Frank M. McKinley** have been elected vice presidents of Humphreys Gold Corp. Weichel, formerly manager of the two ilmenite-zircon mining plants near Starke, Fla., will manage the Jacksonville plant. McKinley also becomes vice president of Humphreys Engineering Co. with headquarters in Denver. **Lee Dailey** was made treasurer of both companies and **Judson S. Hubbard,** who has retired as vice president and treasurer, continues as director of both companies. **Jay P. Wood** is vice president in charge of operations of Humphreys Gold Corp.

Correction: **Edmund A. Prentis's** first name appeared incorrectly in last month's *E&MJ.*

Byron C. Hardinge has been made chief metallurgist for Magnet Cove Barium Corp., a Dresser industry. Before joining Magcobar in 1957, he served as development engineer for Hardinge Co. Inc., York, Pa., and had also worked for the USBM.

R. W. Christoph is now mine manager and an executive of Coballoy Mines & Refiners Ltd., in charge of the Silver Crater, Silver Banner, Juno and Nova Scotia mines of the Colonial and Trinova milling plants, in the Cobalt, Ont. area.

Roy G. Scott, mining engineer with USBM at Albany, N. Y., is now in Washington, D. C.

H. J. Chalmers succeeds the late P. M. Elliott as superintendent of the Sullivan concentrator of Consolidated Mining & Smelting Co. of Canada Ltd.

Victor Dolmage, a director of Cariboo Gold Quartz Mining Co., has been elected to the newly created office of vice president.

B. H. Morrison has been made plant superintendent for Noranda Mines Ltd., Cutler, Ont.

D. C. McDonald, formerly with Copper Rand Mines Ltd., Chibougamau, Que., has joined Canadian Dyno Mines Ltd., Bancroft, Ont.

Garnet T. Page succeeds **L. Austin Wright** as general secretary of the Engineering Institute of Canada. Wright retired after 20 years of service in that post.

Ralph D. Parker, vice president in charge of Inco's Canadian operations, has been re-elected president of the Ontario Mining Association.

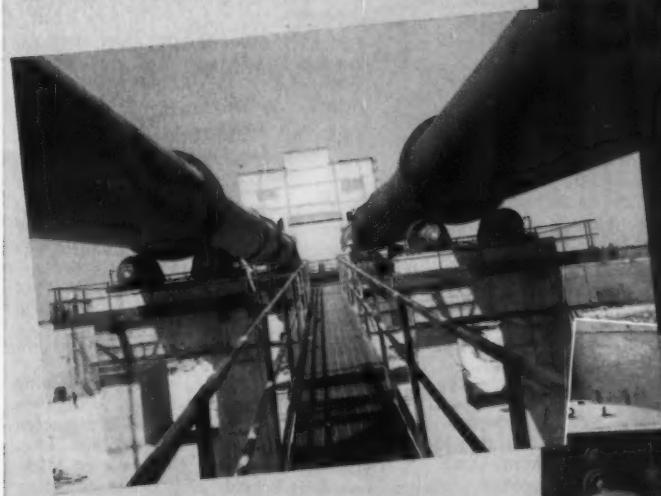
Widmer Succeeds Johnson As N. J. State Geologist

Joseph E. McLean (left), Commissioner of the New Jersey Department of Conservation and Economic Development, extends good wishes to State Geologist **Meredith E. Johnson** upon his retirement after 30 yr in public service. **Dr. Kemble Widmer** (right), succeeds Johnson as State Geologist and chief of the Bureau of Geology and Topography. He becomes the fifth director of the State Geological Survey since its founding in 1864.

SMIDTH

rotary kilns...
grinding
mills and

symetro drives
for
grinding mills



F. L. SMIDTH & CO.

Engineers and Machinery Manufacturers

11 WEST 42nd ST., NEW YORK 36, N. Y.

PERSONALS *(Continued)*

Ralph I. Chamberlin has been appointed director of engineering by Research-Cottrell, Inc., Bound Brook, N. J. He has been employed by Research-Cottrell in various engineering capacities since 1934. A native of Rockaway, N. J., Chamberlin was graduated from Rutgers University in 1929.

Chamberlin

Robert P. Koenig, president of Cerro de Pasco Corp., was awarded the degree of doctor of engineering, honoris causa, at Montana School of Mines' 58th commencement, June 2, on which occasion he delivered the commencement address.

G. F. Greenacre succeeds **R. D. Lord** as manager for Preston East Dome Mines Ltd. Lord is now managing director of the company and of several uranium operations of the Rio Tinto group.

Gerhard Anders, formerly with Panel Uranium Mine, Elliot Lake, is now with Pickle Crow Mines Ltd.

A. M. Cormie, formerly with Torbrit Silver Mines Ltd., Alice Arm, B. C., is now with Geco Mines Ltd., Manitouwadge, Ont.

Anthony R. C. Fowler has been made assistant consulting engineer to Rand Mines Ltd., Johannesburg, Transvaal, South Africa.

Joseph Sedgwick and **B. E. Willoughby** have been elected to the board of directors of Consolidated Denison Mines Ltd. **David Hutchinson,** general superintendent of Consolidated Denison mines, has been made general manager of the diamond mines discovered and operated by the late Dr. John T. Williamson, in Tanganyika, South Africa.

George Baker will be assisted by **Gordon Devey** and **Robert Howe** in his recent appointment as secretary of Rio Tinto Mining Co. of Canada and of all other companies in the group. **Donald A. Macfarlane** was named treasurer of the group's operating companies; **Kenneth Dunn**, assistant-treasurer, assistant-treasurer of Rio Tinto Mining Co. and Rio Tinto Management Services and treasurer of the non-operating group. **John Turnbull** remains treasurer of Rio Canadian Exploration. Assisting Macfarlane are **John Van Netten, E. G. Lambert** and **G. A. Roy.**

Karl V. Lindell, vice president and general manager of Canadian Johns-Manville Co., has been appointed president of the Joint Provincial Mining Associations of Canada for the 2-yr term of 1958/9. He succeeds **L. T. Postle** of the British Columbia Mining Association.

J. D. Barrington replaced **J. M. Cunningham-Dunlop** as president of Hoyle Mining Co. Other officers appointed for the following year were: **A. C. Callow,** secretary, and **J. T. McWhirter,** treasurer. **H. S. McGowan** replaced Cunningham-Dunlop on the board of directors.

H. T. Andrews, former South African Ambassador to France, is now a director of Welkom Gold Mining Co. Ltd. and Consolidated Diamond Mines of South West Africa.

P. G. Braham has taken up duties as mine manager of Australian Development N.L.'s Nobles Nob mine at Tennant Creek.

H. R. Walker, formerly mill superintendent of Anglo-Westralian Mining Pty. Ltd., W.A., has been appointed mill superintendent for United Uranium N.L. at the Northern Hercules mill.

Morton H. Dorenfeld, formerly with Southwestern Engineering Co., has joined the staff of C. F. Braun & Co., Alhambra, Calif., as senior mineral engineer. He will work as a member of the Process Engineering group, doing consulting and economic evaluation on ore dressing and metallurgical processes.

Dorenfeld

Elected directors at American Iron and Steel Institute's annual meeting were: **John L. Neudoerfer,** chairman, Wheeling Steel Corp.; **Walter A. Sterling,** president, Cleveland-Cliffs Iron Co.; and **N. P. Veeder,** chairman and president, Granite City Steel Co. Resignations were accepted from: **A. C. Brown,** Cleveland-Cliffs; **W. W. Holloway,** Wheeling Steel Corp. (elected honorary vice president of the Institute); and **A. E. Walker,** National Supply Co.

OBITUARIES

Dr. Alexander Newton Winchell, 84, prominent mineralogist and petrologist, died June 7, in New Haven, Conn. On the University of Wisconsin faculty since 1907 and until his retirement in 1944, Dr. Winchell had previously taught for seven years at the Montana School of Mines. He held B.S. and M.S. degrees from the University of Minnesota and a doctorate from the University of Paris. After retirement he was Visiting Professor of mineralogy at the University of Virginia, 1948, at Columbia University, 1949, and served several research laboratories as consultant, including American Cyanamid Co.'s Stamford lab. He wrote over 100 papers and a score of books; Dr. Winchell was listed in "Who's Who In America" and "American Men of Science."

Ernest A. Brown, chief, radioactivity division, Mines Branch, Department of Mines and Technical Surveys, died May 15 at his home in Ottawa. He was a member of CIM.

Harvey A. Graves, 54, senior mining engineer with the Department of Mines and Technical Surveys, Ottawa, died May 14. He was a member of CIM.

Paul Jinkerson, 75, retired St. Joseph Lead Co. mine captain, died in Bonne Terre (Mo.) Hospital, June 10.

Walter J. Leamy, 53, operating superintendent of the Sullivan zinc plant at Kellogg, died in a Kellogg (Idaho) hospital, June 7.

John William Monson, 35, superintendent of Colorado Fuel & Iron Corp.'s blast furnace department of the Pueblo plant, died April 11. Monson had begun his career as a junior metallurgist in 1946.

J. M. Shields, of Grand Rapids, Mich., and assistant superintendent at Pickands, Mather & Co.'s West Hill mine on the Mesabi range until his retirement in April 1957, died April 22.

Michael P. J. Walle, 66, chief research engineer, Minnesota Department of Lands & Minerals, died May 22, in Duluth. He was prominent in development of concentration methods for Mesabi range lean ores, and was a past president of Minnesota Society of Professional Engineers.

Michael J. Donovan, 75, chief clerk for Cleveland-Cliffs Iron Co. until his retirement in 1949, died in Hibbing, May 24.

Austin M. Mansfield, secretary-treasurer and director of Quincy Mining Co., Mich., died at Summit, N. J.

C. C. Case, 62, mining engineer and former Butte resident, died June 23. A University of Minnesota graduate, he came to Butte in 1915 to work in Anaconda's engineering department. In 1944 Case moved to Livingston, Mont. to work on Northern Pacific RR's Bozeman tunnel project as an engineer.

Carl J. Sigfrid, 88, prominent mining lawyer who retired in 1956, died June 18 at his Denver residence. He entered law practice at Ouray in 1890 after graduation from the University of Michigan Law School; in 1935 he opened an office in Denver.

Harlan M. Lindholm, 51, former metallurgical engineer for the U. S. AEC, and latterly works representative at Calcined Products (Pty.) Ltd., Suurbekom, Transvaal, on behalf of the Combined Development Agency of the American & British Atomic Energy authorities, died in Johannesburg, South Africa, June 6. He was a graduate of the University of South Dakota School of Mines.

Ross F. Taylor, 67, civil engineer and for the past 15 years Sierra County surveyor, died in Downieville, Calif., June 15. He was active in gold mining development in Sierra and Nevada counties.

Al Cheesman, 58, aviator, well-known among mine explorers of Northern Canada, died recently in a Fort William, Ont. hospital.

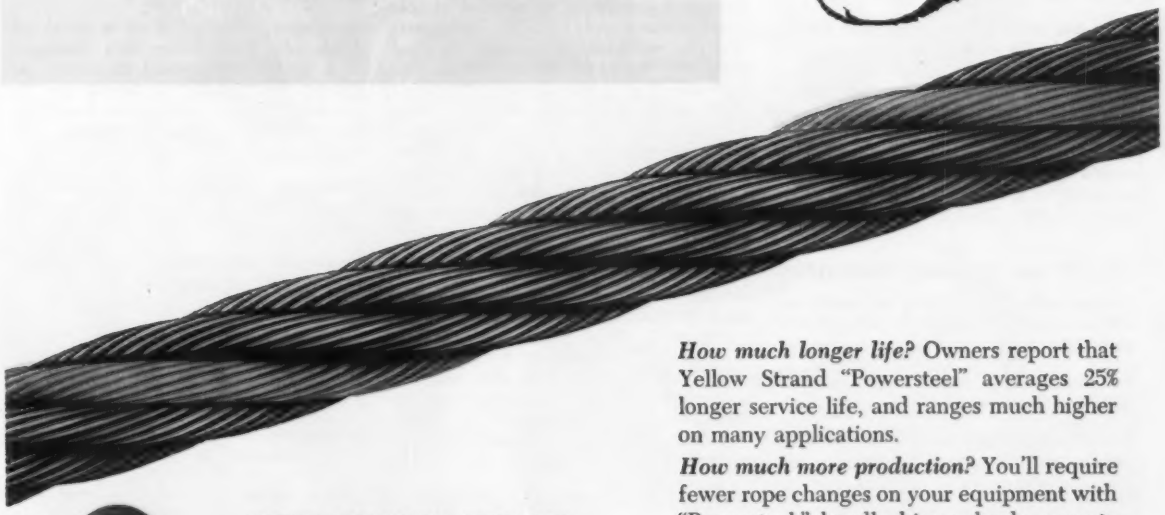
"POWERSTEEL"®

WIRE ROPE

PAYS OFF

Longer Life

Higher Production



How much longer life? Owners report that Yellow Strand "Powersteel" averages 25% longer service life, and ranges much higher on many applications.

How much more production? You'll require fewer rope changes on your equipment with "Powersteel," handle bigger loads, operate larger machines. You'll get greater production and more profit . . . less "downtime" and lower operating costs!

"Powersteel" is an extra high-strength rope for heavy loads and abrasive conditions. It spools freely, resists wear and crushing, and was developed for your high speed, high production equipment.

Your nearby Broderick & Bascom Distributor stocks an ample supply of Yellow Strand "Powersteel." See him for complete details. Broderick & Bascom Rope Co., 4203 Union Boulevard, St. Louis 15, Mo.

NEW! YELLOW STRAND WIRE ROPE CLIPS . . .

Ask for them at your Yellow Strand Wire Rope Distributor. Heavy-duty galvanized steel U-bolt. Drop-forged steel saddle, hot dip galvanized. Easily applied.

Yellow Strand®

Quality WIRE ROPE since 1876

WHAT'S NEW IN U.S. PATENTS

OLIVER S. NORTH

Mining

Design for a pneumatic rotary earth auger adapted to be supported in a mine drift for drilling blastholes. Feed and auger motors are independently controlled in a single housing. E. B. Lear, assigned to Chicago Pneumatic Tool Co. No. 2,837,316.

Blowing device for percussive rock drills permits introduction of an uninterrupted flow of pressure fluid, under full line pressure. Cuttings are removed from hole without necessity of having drill piston reciprocate. G. W. Hulshizer, assigned to Ingersoll-Rand Co. No. 2,837,317.

Diamond drill bit provided with watercourses in its cutting face arranged in such manner as to cause circulating fluid to flow from one watercourse to another across the diamond-studded cutting face, cleaning and cooling all portions thereof. Diamonds are held in narrow lands separated by the watercourses. B. L. Austin, assigned to Christensen Diamond Products Co. No. 2,838,284 and 2,838,286.

Metal and Mineral Processing

Concentrating potash from sylvanite ore, whereby cost of reagents is reduced and uniformly graded, non-dusting concentrates are obtained. W. A. Smith, V. L. Mattson and G. Meyer, assigned to American Metal Co. Ltd. No. 2,836,297.

Precipitating powdered non-ferrous metals, particularly nickel and cobalt, from aqueous solutions of their salts by action of reducing gases at elevated temperature and subatmospheric pressure. F. A. Schaufelberger and W. R. McCormick, assigned to Chemical Construction Corp. No. 2,836,485.

Recovering iron, lead and zinc from mixed ores. Ore is blast-furnace melted to pig iron. Flue dust is recovered and treated in a rotary kiln, e.g., by the Krupp Renn Process, to reduce iron to molten metal and volatilize lead and zinc. Roasted zinciferous pyrite can be smelted in a blast furnace by this method. D. H. Fastje, R. H. Gerlach and O. K. Vorwerk, assigned to Aktiengesellschaft fur Unternehmungen der Eisen und Stahlindustrie. No. 2,836,487.

Treating ammoniacal solutions containing dissolved values of at least one nonferrous metal, such as nickel and cobalt, along with oxidizable sulphur compounds, whereby the sulphur is oxidized and/or decomposed. V. N. Mackiw, V. Kunda and W. C. Lin, assigned to Sherritt-Gordon Mines Ltd. No. 2,836,490.

Purifying $TiCl_4$ to produce a material suitable for the manufacture of titanium metal. C. K. Stoddard and P. J. Maddex, assigned to Titanium Metals Corp. of America. No. 2,836,547.

Mr. North is patent consultant, Washington, D.C.

Improved driving drum for endless chains used to control flow of broken ore or the like to a crusher. Drum is so constructed that chain links passing through it are disposed at an angle of 45 deg thereto. W. Ross. No. 2,837,194.

Improved non-clogging oscillating screen for handling sticky ores comprises parallel rubber strips set into a frame and supported evenly by spaced cross-bridges. R. Ackert and K. Klaeb. No. 2,837,210.

Producing chloride-free K_2SO_4 and K_2CO_3 from langbeinite without the use of KCl. G. H. Gloss and W. J. McGinnis, assigned to International Minerals & Chemical Corp. No. 2,837,403.

Process for recovery of zinc or copper from oxidized ores, especially carbonates such as smithsonite, hydrozincite and malachite. Solute content of an aqueous ore slurry is adjusted by addition of NH_3 and an ammonium salt of a strong acid, e.g., ammonium sulphate. Reaction temperature is held at 50 to 100 deg C to form a soluble metal amine complex and render the CO_2 insoluble therein. CO_2 is recovered for later use and the slurry filtered to remove gangue. Metal-bearing solution is evaporated to recover NH_3 and then treated with CO_2 to precipitate metal carbonate, which is separated, washed and calcined to obtain the metal oxide. Major advantages of the process are: elimination of the ammonia-carbon dioxide separation step, and necessity for using only relatively very low temperatures and pressures. F. A. Schaufelberger, assigned to Chemical Construction Corp. No. 2,837,406.

COPIES OF U.S. patents can be purchased at 25c each from the Commissioner of Patents, Washington 25, D. C.

Producing pig iron or metallic iron by reduction of an iron oxide ore with carbon monoxide and hydrogen. Coke is not required. F. B. Sellers and P. L. Paull, assigned to Texas Development Corp. No. 2,837,419.

Producing chromium of high purity by converting chromic oxide to anhydrous chromous chloride and reducing the latter with hydrogen. H. A. Doerner, by Blanche S. Doerner, sole legatee. No. 2,837,420.

Froth flotation for simultaneously concentrating gold and uranium values from low-grade ores containing gold and uranium but no other economic values. A. M. Gaudin and J. Dasher, assigned to U.S. Atomic Energy Commission. No. 2,838,369.

Treating sulphide ores or other sulphur-bearing materials with molten sulphur to concentrate sulphide values. Pyrrhotite and pyrrhotitic nickel sulphide ores are particularly amenable to this process. J. K. Kaufman and T. K. Roy, assigned to Chemical Construction Corp. No. 2,838,391.

Combination electrostatic-pneumatic system for recovering fluffed, unbroken asbestos fiber from asbestos rock. H. B. Johnson, assigned to Quaker Oats Co. No. 2,839,189.

In a process for recovering KCl from sylvanite, the ore is pre-treated with an organic liquid, the sylvite and halite differentially charged, and the material separated by a high potential electrostatic field. J. E. Lawver, assigned to International Minerals & Chemical Corp. No. 2,839,190.

Reduction of pyrite or other metal sulphide ore by reaction with hydrogen. H_2S gas is decomposed to obtain elemental sulphur plus hydrogen gas for re-cycling. R. Lee, assigned to Lee Foundation for Nutritional Research. No. No. 2,839,381.

Producing titanium and zirconium. R. M. McKinney, assigned to E. I. du Pont de Nemours & Co. No. 2,839,383-4.

Production of titanium metal powder. C. M. Olson, assigned to E. I. du Pont de Nemours & Co. No. 2,839,385.

Producing titanium metal by reaction of $TiCl_4$ with metallic sodium. E. Davies, assigned to Imperial Chemical Industries, Ltd. No. 2,839,386.

In cyanidation of gold, a small amount of a polyamine is added to a normal ore pulp prior to addition of the cyanide. Concentration of calcium hydroxide is maintained below about 0.1 lb per ton of solution. R. W. Burton, assigned to Mining Corporation of Canada, Ltd. No. 2,839,387.

Precipitating zinc compounds from an ammoniacal-ammonium salt liquor containing dissolved zinc and at least one of the following copper, cobalt, and nickel. G. F. Van Hare Jr., and O. S. Kunz Jr., assigned to Chemical Construction Corp. No. 2,839,388.

In a process for recovering gold from cyanide solutions, the gold is adsorbed onto a weakly basic, cross-linked polystyrene anion exchange resin, and the resin separated and eluted to recover values. N. F. Kember and J. Aveston assigned to National Research Development Corp., No. 2,839,389.

Process for recovering lead and zinc from cerussite, anglesite, calamine, smithsonite, galena, sphalerite and other ores of these metals. Oxalic acid is used to solubilize values. T. D. Galloway. No. 2,839,390.

Producing elemental sulphur and high-purity nickel by direct electrolysis of sound nickel matte anodes. L. S. Renzoni and W. V. Barker, assigned to International Nickel Co., Inc. No. 2,839,461.

Coppus VENTAIR (centrifugal type)

Coppus VANO (propeller type)

Choose between them and get 30% to 100% more air

Coppus Blowers are designed for two different types of mine ventilation requirements: the centrifugal Coppus VENTAIR is for long pipe lines; the propeller-type Coppus VANO for shorter lines . . . the correct selection will give you from ⅓ more to twice as much air — for a given power consumption — than an ordinary all-purpose fan.

Available for either compressed air or electric motor drive, both can be used as blowers or exhausters and are obtainable in capacities up to 90,000 CFM.

Only Coppus makes both these types, one of which will give you better, more economical mine ventilation . . . know them by the "Blue Ribbon" that symbolizes the engineering and production skill behind every Coppus product.

Representatives listed in MINING CATALOGS. Other Coppus "Blue Ribbon" products: steam turbines, gas burners, heat killers, air filters, blowers and exhausters *for special purposes. See also THOMAS' REGISTER . . . Coppus Engineering Corporation, Worcester 2, Mass.*

COPPUS ENGINEERING CORPORATION
288 Park Avenue, Worcester 2, Mass.

Please send.....Bulletin 130

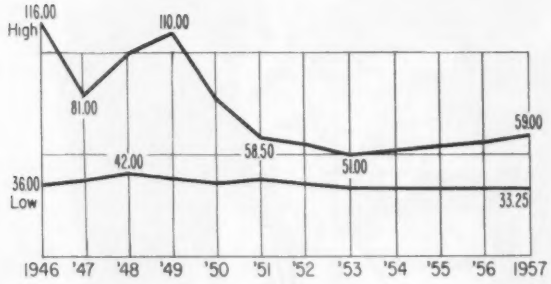
Name.....

Company.....

Address.....

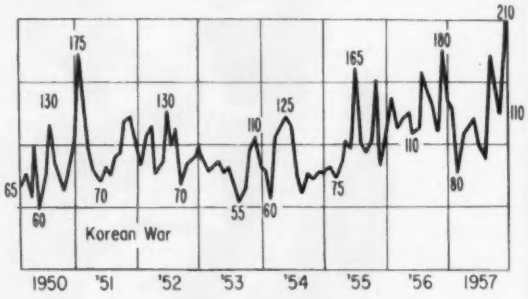
International Bar Gold Prices

(In U.S. dollars at end of month)



Gold Sales In International Markets

(Approximate, in millions of U.S. Dollars)



Gold Production in 1957 Is Highest in History

FRANZ PICK

A CHANGE OF THE ECONOMIC CYCLE started during the first six months of 1957. Slowly engulfing South America, it spread to the United States toward mid-year. Reducing industrial activity and creating major unemployment, the contraction extended to European and Asiatic territories. At the same time, the purchasing power of the American dollar continued to shrink and at the end of March 1958 only 47.85 cents remained of the buying value of the dollar of 100-cent dollar of 1940.

The American gold price, fixed since Jan. 31, 1934 at 35 paper dollars per ounce, was again declared to be the unalterable basis of U.S. monetary policy. But as the Administration's economic program was unable to maintain its former prestige, world-wide doubts as to the permanence of Washington's gold dogmatism arose. The American gold problem was magnified by a simple calculation. The gold price of 35 paper dollars per ounce, if computed at the 1940 dollar value, showed only $16.75 "real" purchasing power dollars.

Therefore, as in previous years, gold again remained a dollar problem but the chances of continued maintenance of its $35 price had become more dubious than in any year since the end of World War II.

Since the beginning of 1957, a clear tendency toward Central Bank acquisition of gold became discernable in many countries, which started to doubt that America could liquidate its "recession" without increasing the price of gold. In June 1957, the then Secretary of the U.S. Treasury, George M. Humphrey, declared during a Senate hearing that if massive gold withdrawals from America should take place such an "outflow" would be stopped. This clear menace of an eventual gold embargo

Data and comment excerpted with permission from the chapter on "Gold" in Pick's Currency Yearbook published recently by Franz Pick, 75 West St., New York 6, N. Y.

International Gold Production

(Not including the U.S.S.R. and its satellite countries. In millions of U.S. dollars based on the official price of $35 per oz)

	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957 (est.)
Total	$805.0	$840.0	$864.5	$840.0	$868.0	$864.5	$913.5	$959.0	$988.0	$1,025.5
S. Africa	405.5	409.7	408.2	403.1	413.7	417.9	462.4	510.7	556.0	596.1
Canada	123.5	144.2	155.4	153.7	156.5	142.4	152.8	159.1	153.9	154.7
U.S.A.	70.9	67.3	80.1	66.3	67.4	69.0	65.1	65.7	64.3	63.6
All other	205.1	218.8	220.8	216.9	230.4	235.2	233.2	223.5	213.8	211.1

FIFTY-FOOT drill holes are driven at the edge of the new National Gypsum pit to supply more ore for the new "multi-million dollar" plant in Quebec.

National Gypsum Opens at Thetford

START of operations at the National Gypsum Co.'s 3,000-tpd asbestos mill was announced by Melvin H. Baker, chairman of the firm, in early July. The mill is located near Thetford Mines, Quebec, as is the mine, which will be mined by open pit at first and will eventually go underground.

Ore from the mine, which is reported by the company to have a potential life of 70 years, goes through primary and secondary crushing, is dried in horizontal rotaries, and subsequently screened, crushed and air separated. The plant will supply National Gypsum's needs and some output will be sold.

PRODUCER

The Wemco S-H Classifier:

Proved – World Standard of Profitable Production

Wemco engineering makes the difference where classifiers must give continuing, top production — at low cost.

The distinction: Wemco exclusive features — 75% pitch design for maximum capacity potential through the use of triple pitch helixes, large shaft size and construction, hydraulic lifting device. Wemco S-H Classifiers are *standard* — industry-wide and world-wide.

Depend on the Wemco S-H Classifier and the skills behind it

WEMCO®

Western Machinery Company
650 Fifth St. • San Francisco, Calif.
and throughout the world

For Economical, Efficient Concentration of Minerals

The SuperDuty® DIAGONAL-DECK® Concentrating Table attains unmatched economy and efficiency through the perfection of long-proved basic riffling arrangements. Even the shape of the deck, designed to conform to the natural path of material flow, eliminates "loafer" riffles. The result is exceptionally high grade concentrates, minimum loss to the tailings and a greatly reduced volume of middlings for recirculation; which in turn, adds more tons of new feed per day to SuperDuty table capacity.

For full information, send for Bulletin 118-B.

CONCENCO®
Feed Distributor

While unexcelled for feeding concentrating tables, the CONCENCO Revolving Feed Distributor effectively provides a splitting of feed into any desired number of equal portions, to accurately feed circuits or machines in battery for their greater overall efficiency. It is a heavily fabricated all steel machine with motor drive requiring 1 H.P. or less in operation.

THE DEISTER ★
CONCENTRATOR
COMPANY
903 Glasgow Ave. • Fort Wayne, Ind., U.S.A.
CONCENCO PRODUCTS

★ *The ORIGINAL Deister Company* ★ *Inc. 1906*

Gold (*Continued*)

damaged the "gold prestige" of Washington.

Beginning in the first weeks of 1958, substantial withdrawals of gold became noticeable. These losses of yellow metal amounted to more than $1.1-billion during the first five months of the year. As the total gold holdings of the U.S. were about $21.6-billion in May 1958—the largest held by any country in the world—the Administration, officially at least, declared them to be completely sufficient. But in none of the official statements was it underscored that this quantity of gold was mortgaged by $10- to $14-billion of foreign government assets in the U.S. which in turn were convertible at any time into gold. Therefore the real gold stock behind the already depreciated dollars was not more than $9- to 12-billion.

This quantity of gold served as backing for $3.18-billion of banknotes, $232-billion of total bank deposits, and $275-billion of Federal debt, totaling $539-billion.

Opposed to the American gold problem was once more the Soviet gold policy which continued to make rather important news in 1957 and 1958. Moscow again sold substantial quantities of gold in Western European trading centers. Estimated shipments totaled about $300-million. These gold exports served to pay for the Soviet and Satellite trade deficit with capitalistic countries, and did not affect the Soviet monetary gold stock, as the USSR equaled South Africa's gold production of nearly $600-million, or 17-million oz in 1957. Such output, corresponding to 58% of the total Free World gold production, was a widely respected achievement. It enabled the Russian currency administration to increase its gold stock to an estimated $7.9-billion at the end of 1957. As in previous years, this quantity was the second largest in the world owned by a single government, and again came nearer to the U.S. net gold stock of $9- to $12-billion.

Gold production rose to its highest level in history in 1957. But the output still was not sufficient to provide enough gold for all currencies that needed it badly. The amount of mined gold, including capitalistic and collectivistic production, has to be estimated at $1.676-billion, compared to its pre-war high of $1.4-billion in 1941. This increase of about 20% compared to an increase of 23% of the world's population in 16 years shows the insufficiency of gold production. See accompanying table on international gold production.

Soviet and Satellite gold production has been estimated as follows for 1957:

	In millions of dollars, based on $35 per oz.
Soviet Union—(17-million oz)..	$595
North Korea—(950,000 oz)....	33
China.....	10
Rumania.....	8
All other.....	3
Total.....	$651

In rotary drilling, pulling a 100-ton, two-mile string of drill pipe subjects the drilling line to the terrific stresses imposed by fast acceleration, shock loads, bending and overwinding on drums. Only wire rope with the highest degree of quality in hardness, strength and fatigue resistance can be used, for toolpushers know that . . .

A quality rope is a safe rope

Whether you use wire rope in the field or in a factory, *safety is just as important to you.* When you buy "bargain" rope you bargain with safety. It can cost you more than the pennies you save. Buy on the basis of *quality*—buy Wickwire Rope.

For extra strength—buy Wickwire's Double Gray IWRC extra improved plow steel wire rope

WICKWIRE ROPE — A CF&I PRODUCT

CF&I

LOOK FOR THE YELLOW TRIANGLE

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

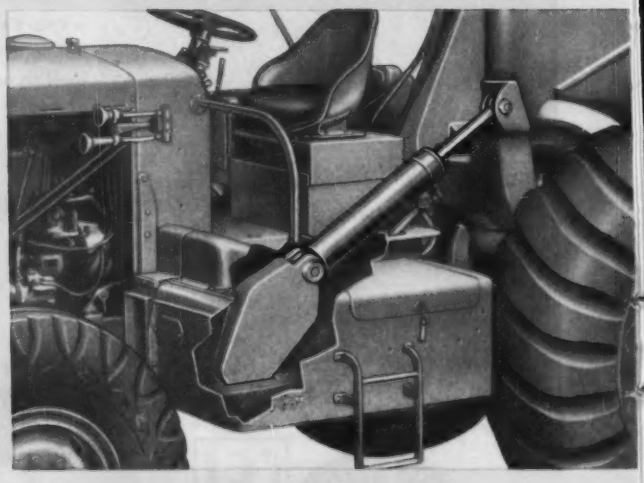
THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso Farmington (N. M.) • Fort Worth • Houston • Kansas City • Lincoln (Neb.) • Odessa (Tex.) • Oklahoma City • Phoenix • Pueblo Salt Lake City • Tulsa • Wichita • **PACIFIC COAST DIVISION**—Los Angeles • Oakland • Portland • San Francisco • San Leandro Seattle • Spokane • **WICKWIRE SPENCER STEEL DIVISION**—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) New Orleans • New York • Philadelphia

5736

REDUCE COSTS... INCREASE EFFICIENCY

3-door Discharge, High Ground Clearance

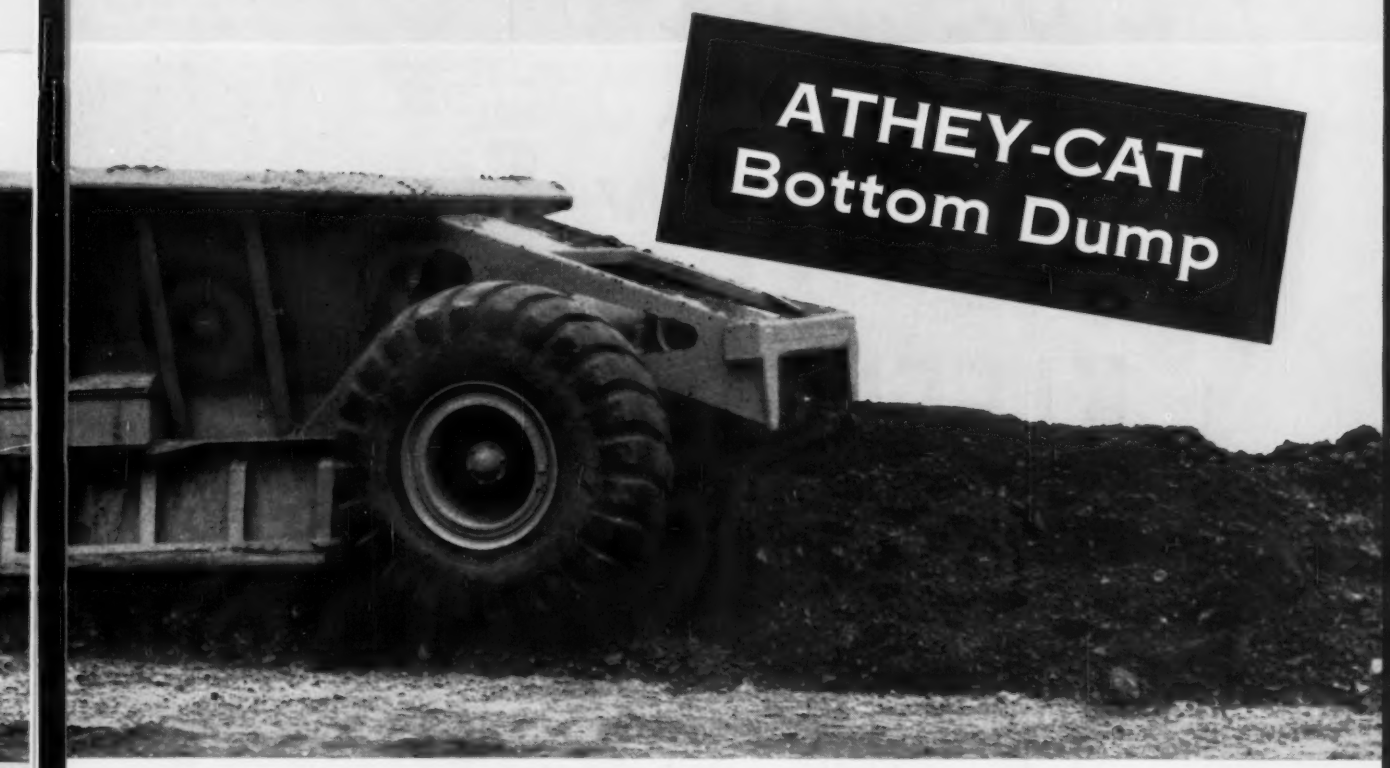
Exclusive Athey 3-door design, 18° side plates and the widest bottom doors in the business, get every load out fast. High rear axle design clears the dumped load. Material dumps instantly, or can be windrowed with positive hydraulic-actuated control.



More Traction When You Need It

Another advantage! Added traction for steep grades, wet road surfaces, sand and mud! Athey's new weight transfer mechanism hydraulically transfers weight from the steering axle and trailing unit axle to the tractor drive wheels, increasing traction and gradeability at the touch of a lever.

on stripping operations!



Caterpillar DW20-Athey PW20 Bottom Dump teams trim the non-productive costs out of stripping and increase efficiency. The big reason? Lower costs per yard compared to other hauling units. The advanced design and premium construction of this new hauling unit provide the key to big production, low-cost stripping. Check these advanced features of the DW20-PW20:

Big Capacity — No Dead Weight: Rated 40-ton payload is nearly 4 times the trailer weight! High-strength "T-1" steel permits use of thinner plates to greatly reduce weight with no loss of strength. Even with a 27 cu. yd. (struck) capacity, the PW20 has a low 8′ 9½″ side loading height to speed shovel loading.

Non-Stop Turns — Fast Haul Speeds: DW20-PW20 unit turns non-stop in a circle only 38′ 4″ diameter. This close 90° maneuverability allows work on narrow benches and in minimum cuts. The big, powerful Cat DW20 Tractor has a rated speed of 35.8 MPH on the haul.

Faster Dumps: The big, wide (6′) bottom doors of the PW20, its steep 18° side plates and its exclusive rear, or third door, permit it to dump fast and clean every time. And with a high arch (5′) axle, the unit rides out over, not through, the dumped load. No more "hang ups" or wasted time on the dump.

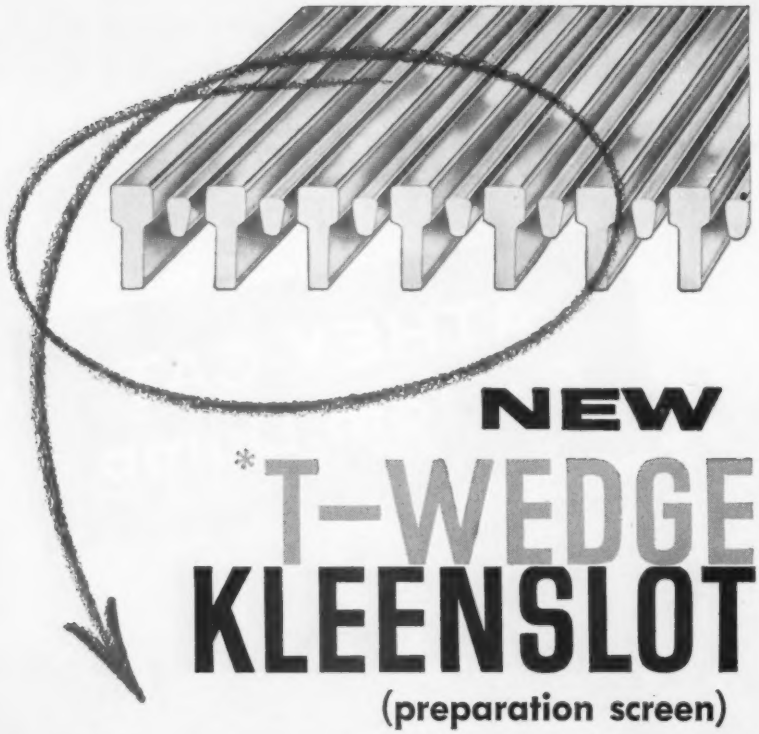
Less Maintenance: Trouble-free design and hard "T-1" steel combine to make the PW20 a rugged performer that stays out of the shop and out on the job. "T-1" has a high impact and abrasion resistance not found in ordinary steels and because of its low temperature impact resistance, it retains excellent characteristics even in sub-zero temperature. Get the full story on the DW20-PW20 Bottom Dump team from your Athey-Cat Dealer. Ask him to show you the new 16-mm film on the unit.

Why take less than the best? Get all the facts on the best stripping tool running. Athey Products Corporation, 5631 West 65th Street, Chicago 38, Ill.

Athey

The Only Complete Tractor-Trailer Line . . . And By the Leaders

See the Athey PW20-Cat DW20 Bottom Dump Trailer on display at the Mining Show in San Francisco.

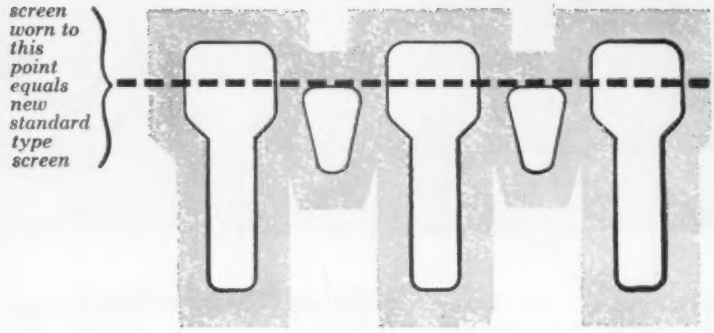


NEW

*T-WEDGE

KLEENSLOT

(preparation screen)



"T" and "WEDGE" wire combine to create the ultimate in...

GUARD BAR DESIGN – high "T" profile wire between every wedge shaped wire performs as guard bar *and* screen

GUARD BAR ECONOMY – new design effects added screening surface, small screen efficiency with large screen life

with *I. F. A. *independent flexing action for non-blinding, non-clogging performance*

new T-WEDGE screen is especially adaptable for flumes or vibrator applications—can be easily interchanged with other types of Kleenslot screens without mechanical changes—abrasion resistant stainless steel

FOR ADDITIONAL INFORMATION . . . write

WEDGE-WIRE CORPORATION
Wellington, Ohio

*patent applied for

Gold (*Continued*)

At the end of 1957, official gold holdings of international agencies and monetary administrations excluding the Soviet orbit totaled $38.55-billion at the official gold price of $35 per oz. Principal distribution was as follows:

	In millions of U. S. dollars
United States	$22,857
West Germany	2,541
Switzerland	1,718
United Kingdom	1,600
Canada	1,100
Belgium	915
Netherlands	744
International Monetary Fund, European Payments Union, Bank for International Settlements	1,599
All others	5,476
Total	$38,550

International fluctuations of bar gold prices, and approximate gold sales in all international markets are shown on accompanying graphs.

Mining Calendar

13th Purdue Industrial Waste Conference & Exhibit. Convention Hall, Philadelphia, Pa., Sept. 15-19.

Rocky Mountain Minerals Conference, AIME, Salt Lake City, Sept. 17-19.

American Mining Congress, San Francisco, Calif., Sept. 22-25

Production Drilling and Blasting Symposium, University of Minnesota, Minneapolis, Minnesota, October 2-4.

Metallurgy '58—Norwegian Industries Development Assn., Oslo, Oct. 15-26

7th National Clay Conference, U.S. National Museum, Washington, D.C., Oct. 20-23

Mid-American Minerals Conference, Society of Mining Engineers, AIME, Chase-Park Plaza Hotels, St. Louis, Oct. 23-25

Metallurgical Society of AIME, Fall Meeting, Detroit, Mich., Oct. 27-30

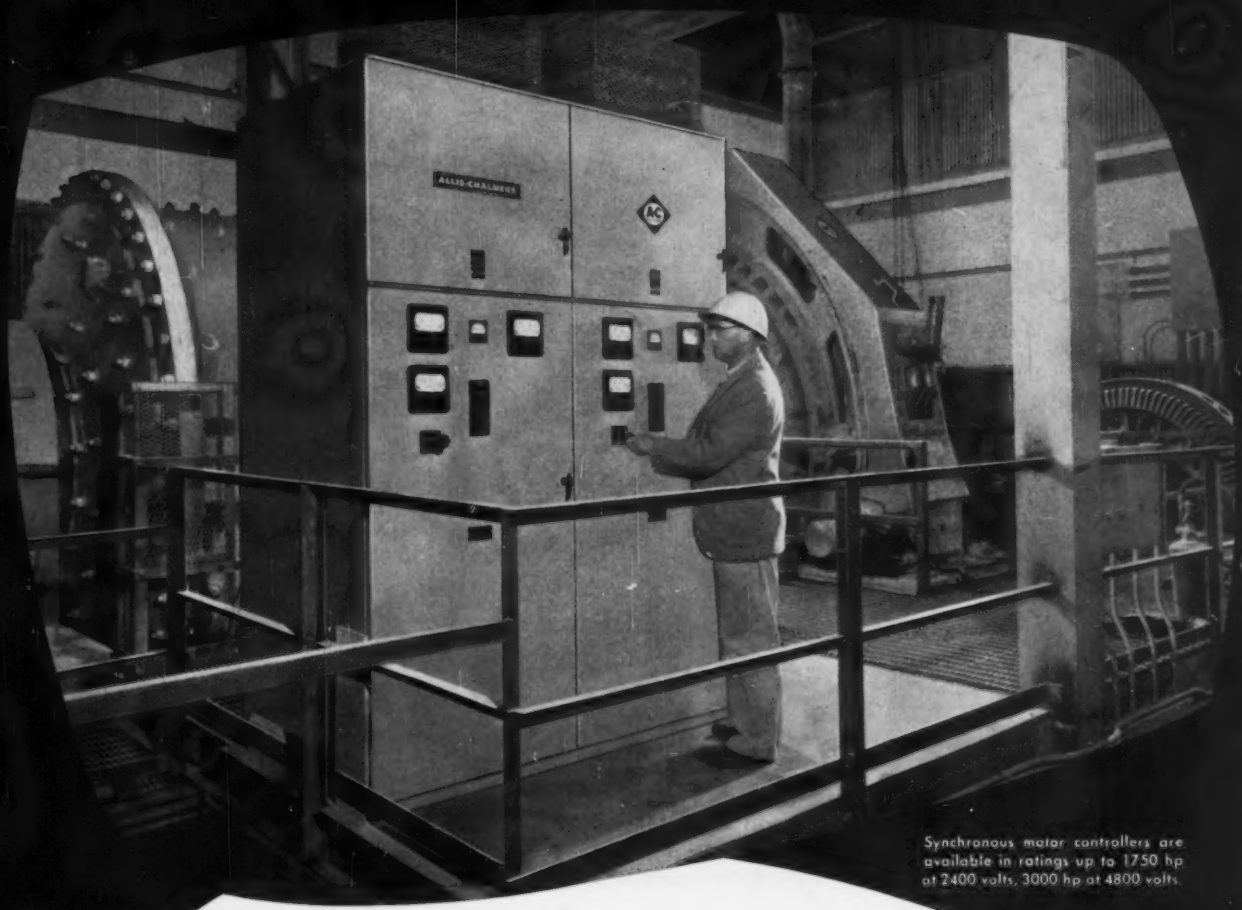
4th Annual Symposium on Mining Research, Missouri School of Mines, Nov. 13-14

AIME annual meeting, San Francisco, Hotel St. Francis, Sheraton Palace, Sir Francis Drake. Feb. 15-19, 1959

Two Symposia Programs Are Announced For Fall

PRODUCTION DRILLING AND BLASTING symposium sessions to be held at the University of Minnesota in Minneapolis on Oct. 2-4 have been announced as follows: Production Drilling (Thursday am); Drill Rod (Thursday pm); Blasting (Friday am); Research and New Techniques (Friday pm) and General (Saturday am).

This is the eighth annual symposium on mining sponsored by the University. Last year the topic was exploration drilling. These and similar series of symposia that were held at Colorado School of Mines and Pennsylvania State



Synchronous motor controllers are available in ratings up to 1750 hp at 2400 volts, 3000 hp at 4800 volts.

Here's synchronous motor control matched to grinding mill requirements

DESIGN of proper control requires a knowledge of both motor and driven machine. Allis-Chalmers designs and builds both grinding mills and synchronous motors. Who, then, is in a better position to design control for grinding mill applications?

When you specify Allis-Chalmers, you can be sure the control circuit is designed to reduce costly down time. Mill-matching is the answer to difficult starting, acceleration, synchronization, and motor protection problems.

For more information about Allis-Chalmers synchronous motor control for any grinding mill application, call your nearby A-C office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

Features

- Current limiting fuses clear short circuit in less than ½ cycle.
- Polarized automatic field application and field failure current relay provide complete field protection.
- Temperature compensated overload relay assures adequate stator protection.
- Instantaneous or time delay undervoltage protection available.
- Automatic inching available for quick, accurate, convenient spotting.
- Enclosures: NEMA 1 gasketed or NEMA 5 dust-tight.

ALLIS-CHALMERS

A-5763

CHRISTENSEN DIAMONDS *mean greater core recovery!*

UNCONSOLIDATED FORMATIONS NOW CORED SUCCESSFULLY!

With newly designed Christensen soft formation barrel and long nose pilot bit

This newly designed diamond coring equipment overcomes the problem of poor core recovery in soft, unconsolidated mineralized formations. By coring ahead of the circulating fluid, the pilot bit, in conjunction with the soft formation barrel, protects the core from moving fluid thereby preventing fluid erosion.

In a recent uranium operation at McKinley County, New Mexico, this equipment was used successfully in the Westwater formation, a soft, unconsolidated sandstone, where previously, high core recovery was very difficult, and many times impossible. The operator reports that this equipment recovered *over twice the core* (up to 98%) that had previously been recovered by conventional equipment. In addition to New Mexico, superior results have been obtained in soft iron ore formations in Southern Utah and Northern Minnesota with a slightly smaller barrel and bit. Excellent results have also been obtained in the Wind River formation of the Gas Hills area in Wyoming.

If your problem is obtaining "good" core in soft, unconsolidated formations contact . . .

CHRISTENSEN DIAMOND PRODUCTS *Less cost per foot*

1937 SOUTH 2nd WEST • P. O. BOX 387 • SALT LAKE CITY, UTAH

Symposia *(Continued)*

University are now jointly sponsored by the three schools. Covering three main topics—rock mechanics, exploration drilling and production drilling and blasting—they will be held on a rotating basis at each of the three schools. The next one on production drilling and blasting will be held in 1960 at Colorado. In 1959, exploration drilling will be covered at Penn State and rock mechanics at Colorado. These symposia aim at gathering together the latest available information on the given subject from industry, government and education.

Tentative subjects for the fourth annual symposium on Mining Research to be held at the Missouri School of Mines in Rolla on Nov. 13-15 have been released. Although they are concerned largely with the subject of ammonium nitrate explosives and cover recent major blasts and current field practices and research work, they also include basic theory of explosives and blasting as well as a report on the underground atomic shot. Water compatible AN explosives is one of the subjects listed. These symposia are jointly sponsored by the U. S. Bureau of Mines and the University of Missouri as a means of presenting the results of research.

Oldest California Lab Dedicates New Building

GROUND WAS BROKEN recently for a new laboratory building to house the oldest research and testing laboratory in the State of California. Abbot A. Hanks, Inc. will construct the new 20,000 square ft facility in San Francisco, with occupancy taking place in November.

PRESIDENT Herbert D. Imrie breaks ground for the new laboratory with contractor E. C. Stendell, vice president T. P. Dresser Jr., and architect J. L. Reid standing by.

The firm was established 92 years ago by Henry G. Hanks, who was the first California state mineralogist. It is owned today by employees who have been with the company.

BILL'S IN A SIZZLE

an ordinary tire "blew" the job

but BOB'S ON SCHEDULE with

U.S. ROYAL SAFETY 1st TRUCK TIRES

service-proved against job delays!

Here's a fact proved at strip mines, sandpits, quarries and construction projects by the hundreds. The best way to prevent costly tire delays and keep hauls *on schedule* is to use U. S. Royal Off-Road Tires!

Here's why. First: today's U. S. Royals give you exclusive, advanced features that pay off in extra traction, greater strength and longer wear. Second: these great new tires are backed up with on-the-spot know-your-stuff *service*—including complete and expert *retreading.*

Find out exactly how easily and quickly *you* can cut job delays with these service-proved tires. Call your U. S. Royal Dealer. Or better still —specify "U. S. Royal" on your next new equipment!

U.S. ROYAL CON-TRAK-TOR®—for rugged operations where utmost traction's required

U. S. ROYAL Super FLEETMASTER—for severe service on all your off-the-road trucks

U.S. ROYAL FLEETMASTER®—Dual Purpose, Nylon—top pull and mileage on and off road

U. S. ROYAL NYLON TIRES ARE TOUGHER, STRONGER, SAFER.

US RUBBER **United States Rubber**

Rockefeller Center, New York 20, N. Y.

In Canada: Dominion Rubber Co., Ltd.

FOR LOW COST HANDLING AND CRUSHING of ★ROCK ★ORE ★SLAG ★MINE REFUSE ★LIMESTONE ★GYPSUM and other materials

McLANAHAN
Heavy Duty
RECIPROCATING
PLATE FEEDER

Built to handle materials from the size of sand to shovel-loaded rock. Rate of material flow automatically controlled. Quickly adapted to production capacity of any machine.

A combination of McLanahan Reciprocating Plate Feeder and Rockmaster Crusher is your answer to the most economical feeding and crushing of large tonnages of rock, ore, limestone, and other materials. Furnished as separate units or in combination as required.

A GREAT COMBINATION

McLANAHAN
Single Roll
ROCKMASTER
CRUSHER

Here is the economical solution to the most rugged crushing applications involving primary or (secondary) reduction of shovel-loaded rock and ore. Special features include —high capacity, low headroom and many other distinct advantages.

Write Today
For Bulletins

McLANAHAN AND STONE CORPORATION
255 Wall Street, Hollidaysburg, Pa.
Manufacturers — Founders — Machinists
Sales Offices in Principal Cities of the United States
Pit, Mine and Quarry Equipment Headquarters Since 1835

McLANAHAN

Spanish Develop New Process For Uranium

SPANISH JUNTA DE ENERGIA NUCLEAR is reported to have developed two new methods aimed at simplifying the recovery of uranium—one is a direct fluorinating process which is said to eliminate three complicated process steps; and the other and more important, is a method of producing uranium oxide by auto-oxidation with a form of ammonia. Ammonium bi-fluorite gas is used and is said to be less expensive than other reagents. German company, Degassa of Hanau, is said to be negotiating for process rights.

South American Gold Will Dredge In Bolivia

SOUTH AMERICAN GOLD & Platinum Co., international mining and exploration firm, has announced that its wholly owned subsidiary, South American Placers, Inc., following agreement with the Bolivian government and approval of U.S. guaranties under the International Cooperation Administration, will embark on a large gold dredging operation in that country, representing a corporate investment of approximately $3-million with production anticipated by the end of 1959.

Reflecting a 25 year agreement reached by the company with the Bolivian government in September 1956 on a concession covering 37,050 acres, this program, the first major U.S. mining venture in Bolivia since 1952, according to Patrick H. O'Neill, South American Gold & Platinum Co. vice president in charge of mining operations, "has been activated on the basis of drilling explorations during the past 18 months on a portion of the property, located along tributaries of the upper Beni River in the lowlands of the Andes."

Tariff Commission Plans Nonmetallics Hearings

THE U.S. TARIFF COMMISSION has announced public hearings beginning Sept. 16 on Schedule 5 (Nonmetallic minerals and products thereof) "of its tentative revision and consolidation of the laws under which imported articles are classifield for tariff purposes. The Commission's tentative proposal is to consolidate these laws into a single set of schedules comprising eight individual schedules for permanent provisions and one appendix for temporary tariff measures. Copies of Schedules 1, 2, 3, 4, Part 1 of Schedule 7, and Schedule 8 have been previously released and the remaining schedules will be released from time to time hereafter.

As each of the schedules is completed and released, copies thereof will be made available for public inspection at the offices of the Commission in Washington, D. C. and New York, N. Y.; at all field offices of the Department of Commerce, and at the offices of

Here's why WEST END can answer your inquiry on shipments immediately!

When you phone an order or request information, the Sales Office Manager in Oakland with whom you speak can contact the plant at WEST END immediately. He talks by private wire teletype with the shipping superintendent on dates, packaging, transport facilities, car numbers. An answer or firm commitment is given immediately. It is relayed to you often while you are still on the phone.

WEST END's Sales Office Manager sales representatives and plant executives work together as a team manning a system that is, in our opinion, uniquely outstanding in the chemical industry. Their confidence in the efficiency of this system is reflected in the enthusiastic, helpful and friendly manner in which they promptly serve you . . . our customers.

WEST END CHEMICAL COMPANY
DIVISION OF STAUFFER CHEMICAL COMPANY
1956 WEBSTER, OAKLAND 12, CALIF. • PLANT, WESTEND, CALIF.

SODA ASH
SODIUM SULFATE
BORAX · HYDRATED LIME

STRIPPING at Cameron, Ariz. for the opening of Mayhew Drilling Co.'s uranium mine, the B. B. Bonner Jr contracting firm is creating a 500x200-ft pit.

THE BIGGEST NEWS IN MINE VENTILATION TUBING . . .

BEMIS SAFETY YELLOW NYPRENE

FLEXIPIPE®

SAFETY YELLOW means just that . . . SAFETY! The yellow Nyprene material reflects light and is readily visible in darkness. It minimizes damage from punctures by machinery and equipment.

Then add these six other major benefits and you'll see why Bemis SAFETY YELLOW Nyprene FLEXIPIPE is your best ventilation value . . .

- Featherweight — fast, easy handling saves labor costs.
- Resistant to acid mine water, oil, grease, abrasion.
- Mildew-proof—will not rot even if stored wet.
- Stores compactly—requires small warehouse space.
- Tremendous tear and tensile strength.
- Long life, low cost, minimum maintenance.

Bemis also manufactures durable, economical Jute-grade FLEXIPIPE. Both types (Jute-grade and Safety Yellow) are available with Bemis Rope Seam Suspension at no extra cost.

Write or wire for complete information about Bemis FLEXIPIPE

Bemis

408-E PINE STREET, ST. LOUIS 2, MISSOURI

Mayhew Uranium Pit Prepares for Mining

REMOVAL OF 117 FT of overburden was necessary before start of operations at the Mayhew Drilling Co. uranium pit at Cameron, Ariz. The job was completed in July when the Bonner contracting firm of Flagstaff cleared some 250,000 cubic yd of shale, clay soapstone and ore bearing sand. Material was unusually difficult, and ripping of the waste had to be undertaken between 50 and 75 ft.

Stripping, using Allis-Chalmers motor scrapers, two crawler tractors and one tractor shovel, was on a two-shift basis with a five-man crew.

Hearings *(Continued)*

collectors of customs and appraisers of merchandise at all headquarters ports of entry in the U.S.

After all the schedules have been released and public hearings have been held thereon a final draft and report will be submitted to the Congress and the President for consideration. The Commission is preparing the proposed revision and consolidation pursuant to Title I of the Customs Simplification Act of 1954. The ultimate adoption of the proposed new schedules is dependent upon the enactment of further legislation by the Congress."

French Geology Teams Spur African Searches

ACCORDING TO JOSEPH C. ARUNDALE, U.S. Consul in Elisabethville, French Equatorial Africa, field teams sent into the bush in 1956 and 1957 by both private corporations and the Dept. of Mines and Geology have uncovered several mineral deposits which are now being developed for production—

Lead—at Hapilo, 5 kilometers from M'Foutai mine, the Compagnie Miniere du Congo Francais has developed a deposit and is already in production.

Diamonds—In west Oubanqui, the Pacific Tin Co. and its subsidiary, Compagnie Miniere de l'Oubanqui Oriental, have decided to develop an alluvial diamond site along the Sangha River.

Change motors in minutes—

with FALK *all-steel* MOTOREDUCERS

No long and costly "down time" involved

Motors can be interchanged or replaced *in minutes* with the all-steel, All-Motor type FALK Motoreducer. No long and costly "down time" is involved in making the change!

Best of all, replacement is not limited to original make of motor—new NEMA frames may be substituted for old. This versatile Motoreducer operates with any make, speed or type of standard foot-mounted motor within its AGMA rating. No modification, no special shaft, no "partial" motor required.

In addition to unmatched motor interchangeability, this dependable gear drive—the "work horse of industry"—offers: widest choice of output-shaft position (horizontal, vertical, right-angle)...any output-shaft connection...any mounting, including wall and ceiling...standard speed range from 1.5 rpm to 1430 rpm. All these advantages, plus proved efficiency, low maintenance and extra-long life, make the All-Motor type FALK Motoreducer your best buy for any job requirement.

Furnished in sizes up to 75 hp with any make, style or type of motor; or, *without a motor if desired.* FALK Motoreducers are available from convenient factory, field or distributor stocks, from coast to coast.

Write for Bulletin 3100

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

MANUFACTURERS OF:

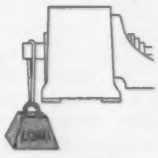
- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

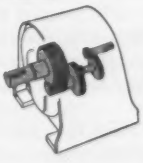
...a good name in industry

FALK "IN-BUILT" FACTORS assure full dependability—better service—longer life

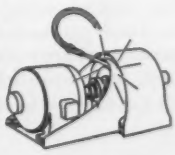
ALL-STEEL HOUSINGS
Rugged, strong, rigid ...all parts heavy steel plate, formed and welded in the Falk Weld Shop.



LARGE OVERHUNG LOAD CAPACITY
Large shafts, oversize bearings...rigid mountings with wide bearing spans to handle maximum loads.



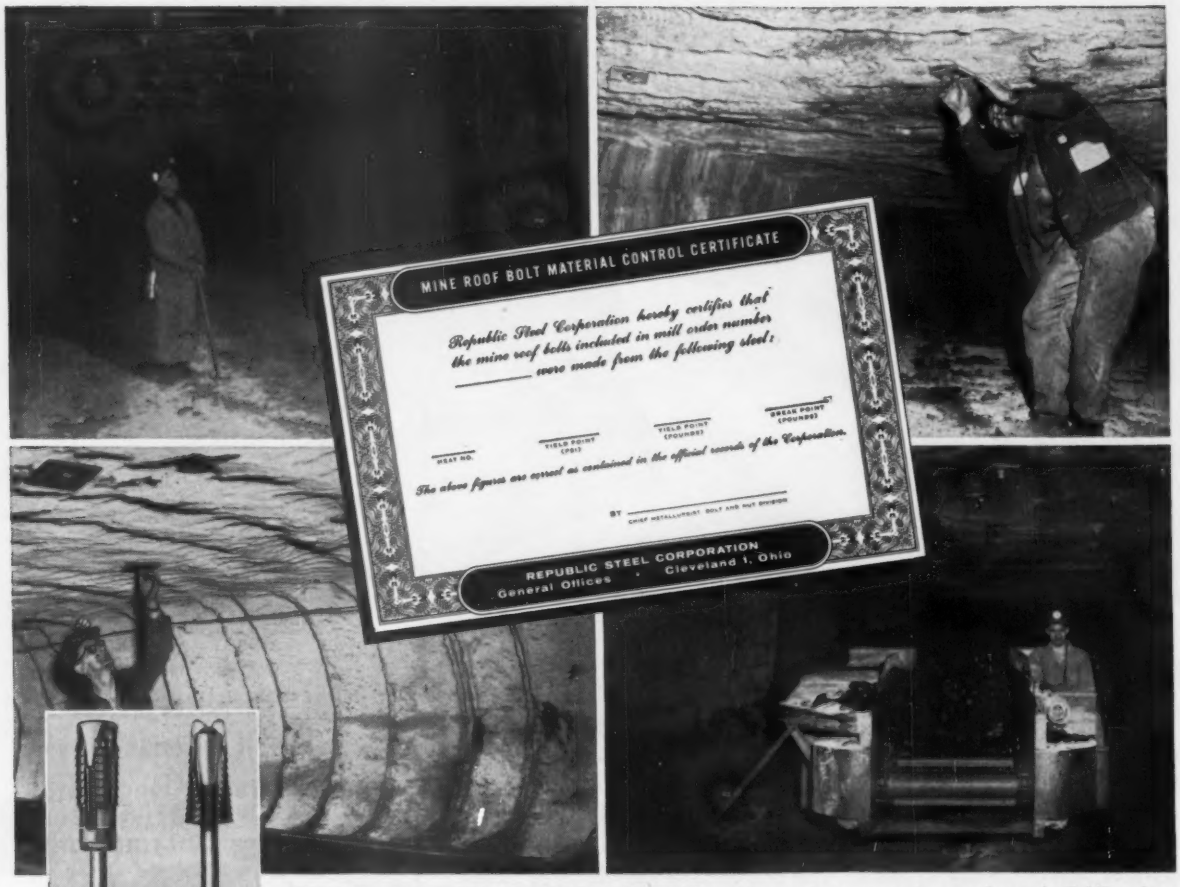
PRECISION GEARING
Heat-treated alloy steel gearing, precision cut and shaved after heat treatment to eliminate distortion.



SEALED HOUSINGS
Splashproof, dustproof, oiltight. Dual closures and one-way vents keep oil in, dust and moisture out.

REPUBLIC, ALONE, GIVES YOU

Certified Roof Bolt Strength


MINE ROOF BOLT MATERIAL CONTROL CERTIFICATE
Republic Steel Corporation hereby certifies that the mine roof bolts included in mill order number _____ were made from the following steel:
HEAT NO.
YIELD POINT (PSI)
YIELD POINT (POUNDS)
BREAK POINT (POUNDS)
The above figures are correct as contained in the official records of the Corporation.
BY _____
CHIEF METALLURGIST, BOLT AND NUT DIVISION
REPUBLIC STEEL CORPORATION
General Offices • Cleveland 1, Ohio

REPUBLIC'S COMPLETE LINE OF ROOF BOLT ASSEMBLIES enables you to secure maximum roof control reliability wherever roof bolting is practical. Newest shell types are shown in inset. Unit on the left, mounted with a pal nut on a square head bolt, is the RE-2 expansion shell for use in relatively soft rock. It can be shipped assembled with the bolt, or separately. Unit on the right, the RE-3, is well suited to harder formations.

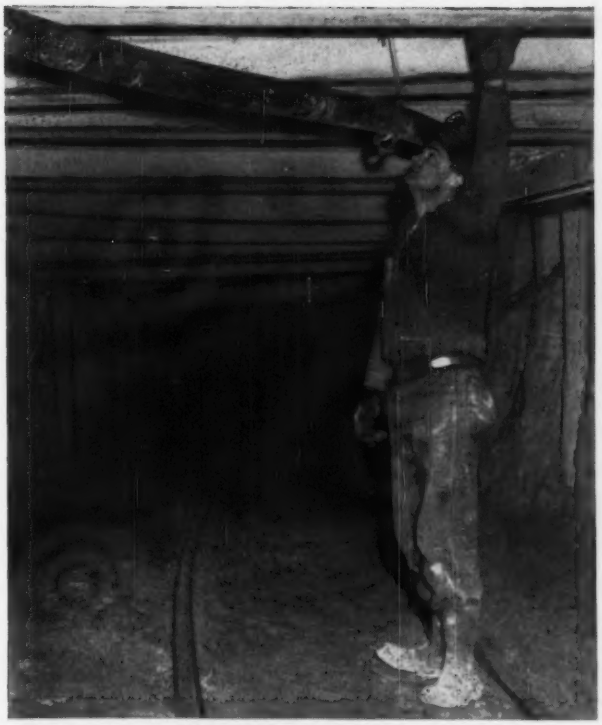
Next time you order roof bolts, consider these facts: First, Republic Roof Bolts cost no more than any other brand. Second, Republic, alone, certifies the strength of the steel used in roof bolt manufacture. The Material Control Certificate, which is included with every shipment, guarantees that physical properties meet or exceed the mining standards approved by the American Mining Congress and American Standards Association.

Republic is able to offer this exclusive Certification Program through complete control of all manufacturing operations, from mining and blending of ores to final inspection of finished roof bolt products. During processing, samples of each heat of steel are tested to destruction to make sure that bolts will meet established performance specifications. Heats are kept separate so that individual test results can be entered on certificates as shipments are made.

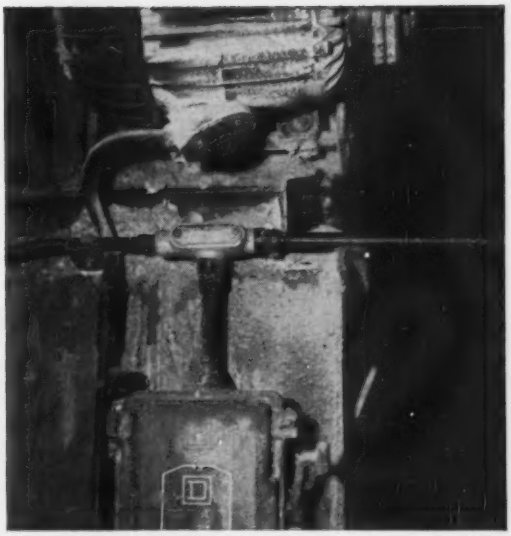
Beyond laboratory verification, however, Republic maintains a continuous field testing program to double check performance under actual service conditions. Every new design is subjected to exhaustive trials in Republic's own mines. Performance capabilities are documented and, equally important, complete data are gathered showing strata conditions, methods of placement, and spacing to which each design is particularly adapted.

As a result, Republic offers the widest selection of completely proved roof bolt assemblies available from a single manufacturer. Moreover, Republic can provide engineering assistance to help you select the type or types best suited to your conditions.

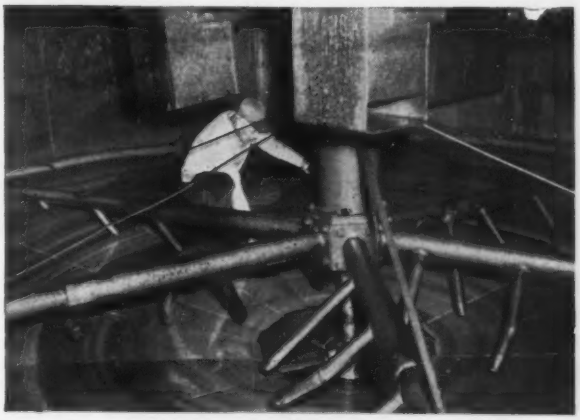
It will pay you to get all of the facts on certified-strength Republic Roof Bolt Assemblies. Simply contact your nearest Republic representative, or mail coupon.



REPUBLIC FLEXIBLE PLASTIC PIPE GIVES YOU EXCELLENT SERVICE in mine water handling applications. Made of tough polyethylene, it is easy to handle in cramped quarters and conforms readily to irregular contours. Light weight and easy cutting and joining simplify installation. Relocation to meet changing conditions ceases to be a problem. Republic Flexible Plastic Pipe is impervious to the corrosive elements normally found in mine water, assuring years of trouble-free operation. Mail coupon for further information.



THE STRENGTH OF STEEL PLUS THE CORROSION-RESISTANCE OF PLASTIC are provided by Republic "Dekoron®-Coated" ELECTRUNITE® E.M.T. When properly installed, this versatile electrical raceway gives your circuits long-lasting protection against corrosive fumes, gases, and vapors. What's more, the extruded plastic armor of "Dekoron-Coated" ELECTRUNITE in no way interferes with installation. Only ordinary tools are required. Joints are corrosion-protected by wrapping with pressure-sensitive plastic tape. Send coupon for complete facts.



HIGH STRENGTH PLUS ABRASION AND CORROSION-RESISTANCE were the determining factors in the selection of Republic ENDURO® Stainless Steel for the bottom of this classifier. In operation, it is subject to extreme abrasion by a slurry mixture of coal, waste, and water which is pumped from the revolving arms. Experience has shown that ENDURO, because it outlasts ordinary carbon steel many times, provides maximum long term economy. For complete information on Republic ENDURO Stainless Steel, mail coupon.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. EJ-6044
1441 REPUBLIC BUILDING · CLEVELAND 1, OHIO

Please send more information on:

☐ Mine Roof Bolts ☐ FE Plastic Pipe ☐ Stainless Steel
☐ Dekoron-Coated E.M.T.

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

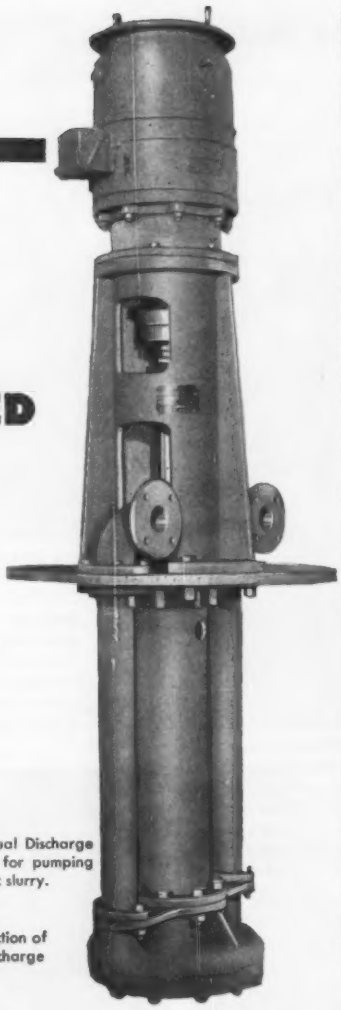
VERTICAL PUMPS

WITH

NO SUBMERGED BEARINGS

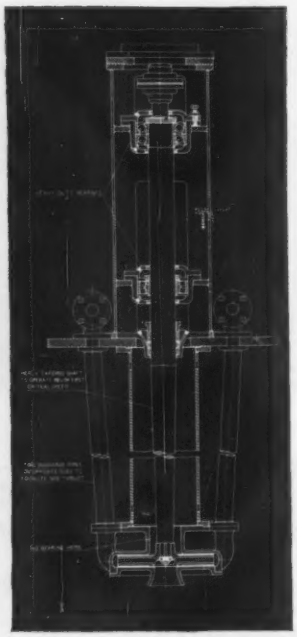
FOR PUMPING

ABRASIVE CORROSIVE SLURRIES



2" Dual Discharge Pump for pumping caustic slurry.

Cross section of Dual Discharge Pump.



This rugged type of service calls for advanced design: — extra heavy shaft, double-ported casing to equalize the side thrust of the impeller, and tough abrasion-corrosion resistant alloys. The dual discharge pump illustrated here incorporates these features and dispenses with bearings or packing below the cover plate where they would be in contact with the liquid.

Difficult pumping problems, particularly in the process industries, have been our specialty for ninety-one years. Perhaps we can be of help to you. Write us — no obligation.

LAWRENCE PUMPS INC.

For complete information about Lawrence Slurry and Sludge Pumps write for Bulletin 207-4.

371 MARKET STREET, LAWRENCE, MASS.

French Searches *(Continued)*

Manganese—Comilog will mine Gabon orebody. Construction of 280-kilometer railway and aerial tramway was begun in 1958. Production is scheduled for 1961, with 1-million annual tons, 45% MnO_2 output (U.S. Steel 49% Comilog 51%)

Uranium—A company is being formed —the Company of Uranium Mines of Franceville—to mine and concentrate to 50% U_3O_8 what appears to be scattered deposits covering a possible 2,500 square meters. Estimated tonnage is at least 100 tons of metal. Hydroelectric and sulphuric acid plant will also be built. Mokta-El-Hadid, Paris Union Bank, Rothschild Bank and French Atomic Energy Commission will form the company.

Cassiterite—in Moyen Congo, Societe Minetain du Congo Francais will mine what is reported to be a deposit, modest in size, but excellent in tenor.

Wolframite—in Tibesti, a surface operation by the Mining Bureau of Overseas France has been started. Production in 1958 is expected to hit 100 tons.

Iron—the study syndicate formed in 1955 by Bethlehem Steel, French and European interests (Bureau Minier de la F.O.M., Baque de Paris, Cofimer, Suez to name a few) will now become Mekambo Iron Mines Co. with Bethlehem having 50% share. Indicated reserves are estimated at more than 200-million tons, 63% Fe.

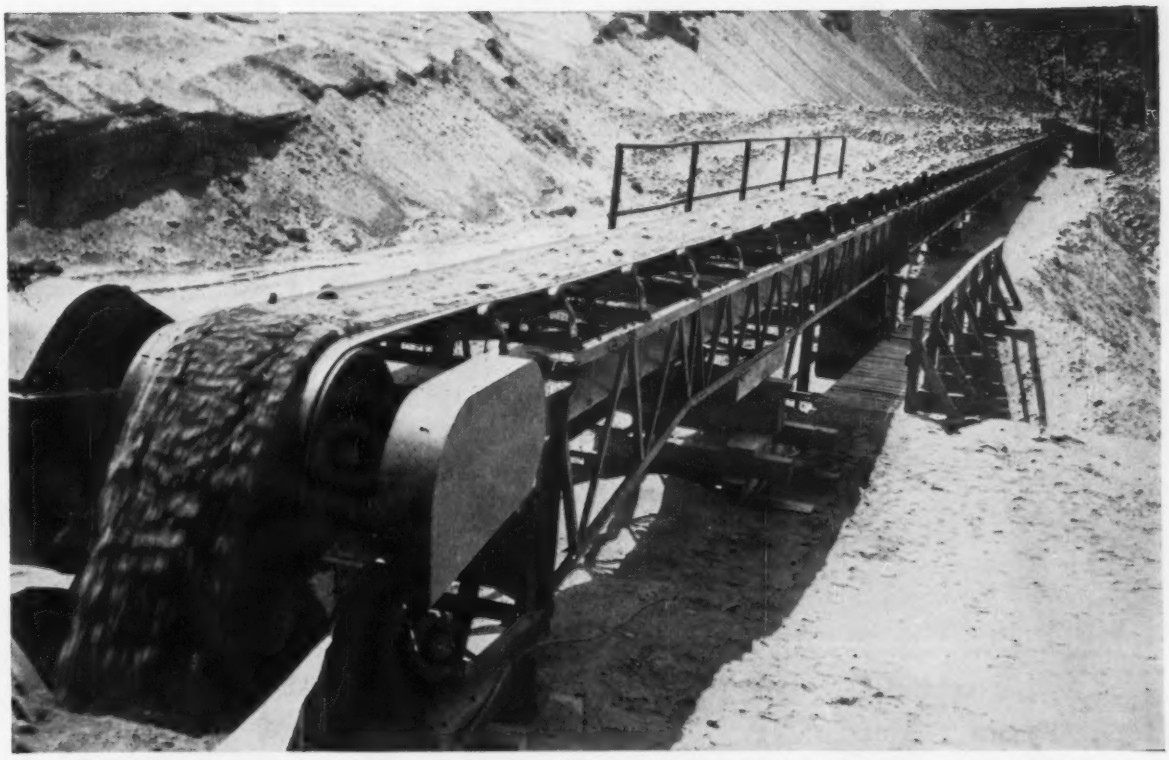
Rock salt and potash—Discovered along the Ogooue, deposits will be explored and drilled by Syndicate for Potash Research (Gabon) in the area of Azingo, between Lamarene and Port Gentil.

Consul Arundale's remarks may be found in *Mineral Trade Notes, Special Supplement No. 54,* June 1958., U.S. Department of Interior, Bureau of Mines, Washington, D. C.

Fused Salt Converts Sulphide to Copper Metal

LABORATORY WORK has shown that pure copper and sulphur can be recovered from fused salt electrolysis of cuprous sulphides in a barium chloride electrolyte, according to T. P. Hoar and R. G. Ward in *IMM Bulletin* No. 618. In the process, white metal from the converter is used as electrodes. If developed commercially, the authors foresee white metal being fed to the electrode pools while continuous electrolysis of the barium chloride electrolyte would be pursued at maximum current density of 1 amp/cm² at the anode. Gaseous sulphur would be led from the cell and condensed. Copper would be allowed to accumulate under the cathode and tapped when a rise in cell voltage showed that all the cuprous sulphide, and most of the dissolved sulphur, tellurium and selenium had been removed.

The authors estimated that 3280 kwh would be required per short ton of copper at operating temperatures of 1156 deg C and 93.5% current efficiency—



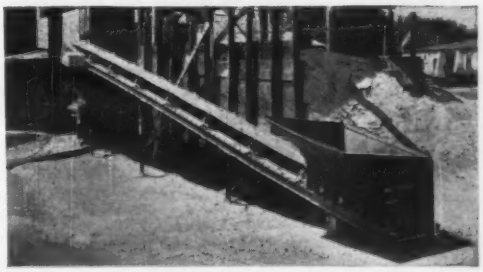
LONG HAUL—Even the longest Barber-Greene Conveyors are built of standardized components . . . produced on a precision, quantity production basis. They can be assembled in almost limitless combinations to cut the time and cost of any material handling job.

Long or short haul—it costs less to move materials with belt conveyors

Thousands of installations—ranging from a few feet to thousands of feet—prove that belt conveyors move bulk material at lowest cost.

No other machine is so simple in construction or requires so little maintenance. No other machine can deliver such high hourly capacities with so little power or attention.

Barber-Greene has given a new meaning to belt conveyor economy. Built of standardized components, Barber-Greene Conveyors are delivered sooner . . . require less engineering . . . are erected faster . . . give top performance . . . and are more easily altered to meet changing or expanding requirements. Being standardized, repair parts are readily available—usually from the stock of your local distributor.



SHORT HAUL—Even the shortest Barber-Greene Conveyors are available in standardized components in the width and length to suit your needs. These small conveyors provide the economical way to handle the widest range of materials with greatest flexibility.

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

Bulk Mineral Storage by the SAUERMAN Method

Reclaiming Triple Superphosphate to Hopper

How Sauerman Scraper Storage Reduces Costs

Overall View of Storage

200,000 tons of triple superphosphate are produced each year in this new Florida plant. It is delivered by overhead conveyor to a 329' x 146' storage building of 35,000 ton capacity. The material is then stockpiled and reclaimed by a 2½ cu. yd. Sauerman Scraper at a rate of 150 tph.

Here's how a Sauerman Machine cuts costs:

One operator, located in a safe station overseeing the entire area, can recover practically 100% of all stockpiled material.

All highly machined parts, hoists and motors can be located outside of the building and protected from corrosion and dust.

When parts are replaced—sheaves, clutch or brake linings—the machine is restored to practically new condition, even though it may be twenty or more years old.

Only the Crescent scraper and cables contact the material. The scraper machine can be designed to operate the scraper on top of non-caving material. This allows the scraper to break down any high faces that may be standing.

Sauerman Storage Machines are built for hourly capacities of from 20 to 600 cu. yds. A partial list of producers and manufacturers using some type of Sauerman equipment includes:

Consumers Cooperative Assn.
Crawford Chemical Co.
Davison Chemical Co.
Division of W. R. Grace & Co.
Duval Sulphur & Potash Co.
F. S. Royster Guano Co.
International Minerals & Chemical Corp.
Lion Oil Co.
Potash Company of America
Tennessee Farmers Cooperative
Virginia-Carolina Chemical Corp.
Southern Agricultural Fertilizer Co.

For ways to reduce your material handling costs, write to Sauerman's experienced engineers. Request Catalog E, Bulk Storage by Scraper and field reports on handling of your material by Sauerman Machines.

SAUERMAN BROS. INC.

626 S. 28th AVE. | BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

Fused Salts *(Continued)*

this is much better than the power consumption for aluminum production in a Hall pot.

Corrections

The activities of Cerro de Pasco at the Rio Blanco property in Chile were inaccurately reported in the June 1958 issue of *E&MJ* (p 160). Cerro de Pasco has extended the option to purchase Rio Blanco for an additional two years. Drilling performed last year will be continued this year, including some underground exploratory work. A jeep access road has also been completed on the property. The discussion of a hydroelectric plant at the site was erroneous.

In *E&MJ's* Mid-June Guidebook, the Blu-Ray diazo machine was incorrectly listed under photocopy machines. Blu-Ray is a compact white-printer, or diazo machine, which produces positive copies of any material typed, drawn or written on translucent paper, up to 42 in. wide. To handle opaque paper, where inexpensive multiple copies are needed, a photocopy developer is used as an adjunct to the Blu-Ray to produce a translucent intermediate, from which multiple copies may be produced by Blu-Ray.

British Use Hydraulics In Three Coal Collieries

THE NATIONAL COAL BOARD of Britain is experimenting with hydraulic mining underground. The system to be introduced at Trelewis mine, in Wales, uses a ¾-in. dia water jet with the product washed down flumes to screens where plus-2-mm coal is transferred to normal conveyors and minus-2-mm is sluiced to a sump and the slurry pumped to the surface. The method is similar to that used at American Gilsonite's plant near Grand Junction, Colo. (See *E&MJ*, September 1957, p 106.)

Advantages cited by NCB include: increased rate of output, simplicity and maneuverability of underground equipment, location of power plant at the surface eliminates flameproofing, explosive danger is eliminated. Tests will also be run at Woodsend and Markham.

Linde Oxygen Plant Opens

A NEW oxygen producing plant to supply jet-piercing rings on the Minnesota taconite ranges has been constructed by Linde Co., a division of Union Carbide Corp. The plant is capable of producing 65 tons of oxygen per day to supply the expanding taconite demand.

Magnet Cove Re-Opens

MAGNET COVE BARIUM has re-opened its Malvern, Ark. plant and mines "for a very limited operation," manager J. A. Starks has announced. The plant had been closed down when demand for oil well drilling mud declined earlier in the year.

product:

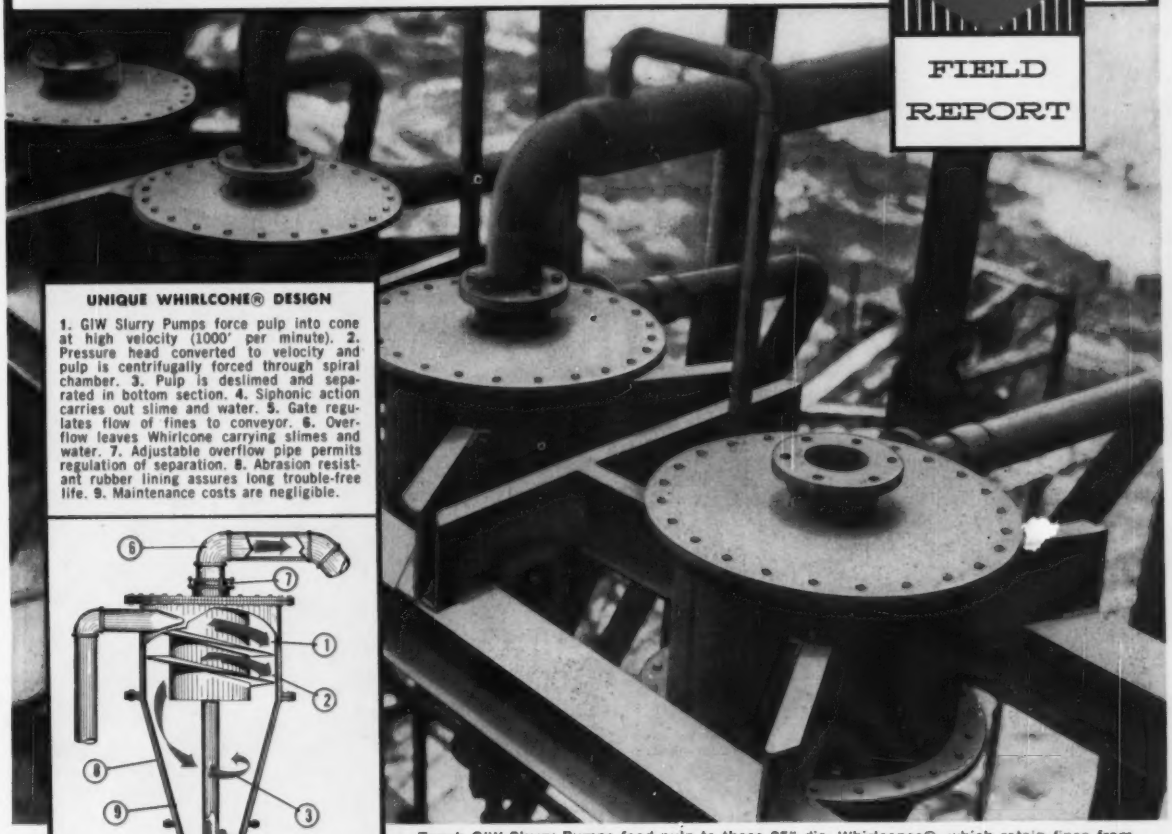
COTTRELL WHIRLCONE® SEPARATORS

customer:

BECKER COUNTY SAND & GRAVEL CO.

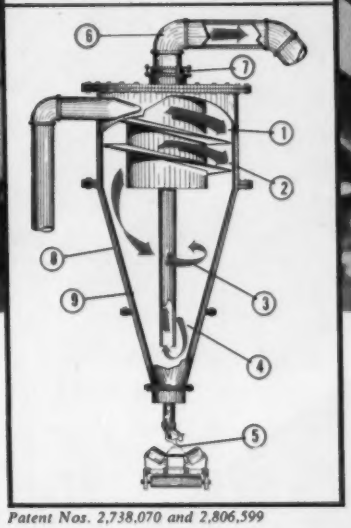
GIW

FIELD REPORT



UNIQUE WHIRLCONE® DESIGN

1. GIW Slurry Pumps force pulp into cone at high velocity (1000' per minute). 2. Pressure head converted to velocity and pulp is centrifugally forced through spiral chamber. 3. Pulp is deslimed and separated in bottom section. 4. Siphonic action carries out slime and water. 5. Gate regulates flow of fines to conveyor. 6. Overflow leaves Whirlcone carrying slimes and water. 7. Adjustable overflow pipe permits regulation of separation. 8. Abrasion resistant rubber lining assures long trouble-free life. 9. Maintenance costs are negligible.



Patent Nos. 2,738,070 and 2,806,599

Tough GIW Slurry Pumps feed pulp to these 25" dia. Whirlcones®, which retain fines from classifier overflow. Maximum recovery rate is 20 tons per hour per cyclone. The cones will handle material from −12 mesh to lightest slime.

Whirlcone® Separators solve difficult fine recovery problems.

The retention of fines in the −50 plus 200 mesh range posed a disturbing problem for the Becker County Sand & Gravel Co., of Cheraw, S.C., primarily because the large amount of water used in processing the sand and gravel washed out the desirable fines with the minus 200 slimes.

Fourteen 25" dia. Whirlcone® wet type cyclones installed parallel in four Becker plants solved this problem completely. Operating an average of 8 hours daily, they extract up to 100 tons of clean, fine sand per hour from wash water while the minus 200 mesh slime is discarded.

Recovered fines are used to bring sand up to specifications. Thousands of tons of valuable sand, formerly lost, soon paid for the low cost of the Whirlcones®.

GIW's highly efficient Whirlcones® are also being used in the mining fields to deslime, degrit, classify, concentrate, make dam and mine backfill and to dewater or thicken where the overflow can be returned to the process or it can be discarded.

They are available in diameters from 6" to 50". Capital cost including the pump is 20 to 50% of conventional classifiers.

If you are losing fines from material −12 mesh to lightest slimes, write today. Recommendations and literature will be forwarded promptly.

COTTRELL ENGINEERING
Division of
GEORGIA IRON WORKS CO.

GIW

Manufacturers of pumps, dredges, separators and accessories.

AUGUSTA • GEORGIA

marcy mills...

"No Compromise with Quality"

YOUR ASSURANCE OF

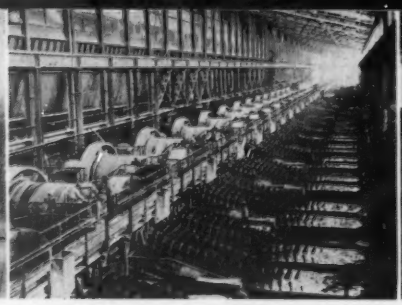
▶ **low net-cost-per-ton grinding**

AND

▶ **long operating life**

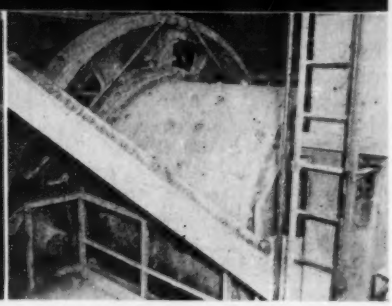
Since 1915...

seven 8'x 6' Marcys, purchased in 1915 by a U. S. copper company, are now being used in a Philippine Island mill. After 43 years these mills are still operating with their original gears.



For 15 Years...

these 10'x 10' Marcys have been operating in a large copper mill. There have been no bearing problems and the original gears are just now being reversed.



Since 1915...

this 8'x 6' Marcy is still working 24 hours per day in a large cement plant after 43 years of dependable mechanical operation.

THE MINE AND SMELTER SUPPLY CO.

DENVER 16 3800 RACE | NEW YORK 17 122 E. 42ND ST. | SALT LAKE CITY 1 121 W. 2ND S. | EL PASO P. O. BOX 1162

SALES AGENTS AND LICENSED MANUFACTURERS THROUGHOUT THE WORLD

MARCY

Mexico's New President Seeks Foreign Capital

MEXICO'S president, Adolfo Lopez Mateos, who won in the national elections in July, has come out solidly in favor of foreign capital moving into his country. But, he has underlined the fact that he wants capital moving into the industries and special situations where it is needed most. He claims that Mexico will need at least $1-billion inflow of capital during the first few years he will be in office.

In Mexico's mining industry, spokesmen say that to get new companies to move in, the government will have to rewrite the mining code and change the stiff direct taxes mining companies now have to pay. Insiders in President Lopez Mateos group maintain that the new government will have the rejuvenation of Mexico's mining at the top of list of "urgent business" to be done after the inauguration December 1.

PRESIDENT Adolfo Lopez Mateos

Local miners say that there are signs that the industry might pull out of some of its doldrums during the second half of 1958 because of the firming up of copper and other prices in the U.S.

In June, you could see signs of new activity in mining. American Smelting & Refining Co.'s Mexican subsidiary sent out a shipment of 7,000 tons of copper and lead from Tampico which was worth around $2-million. The company said it was readying other, similar shipments for the rest of the month.

But most mining company officials in Mexico claim that even though prices firm up, something will have to be done about the 15% production and 25% export taxes now imposed by the government. If the industry is ever to return to the old boom days, miners say, the government will have to rearrange the present tax structure and offer a definite incentive.

"We have some nice claims and some pretty big projects in the drawer waiting for the day when some incentives show up on the horizon," one mining executive told *E&MJ*. Many companies

HUBER-WARCO
motor graders

5D-190 in service on haul roads

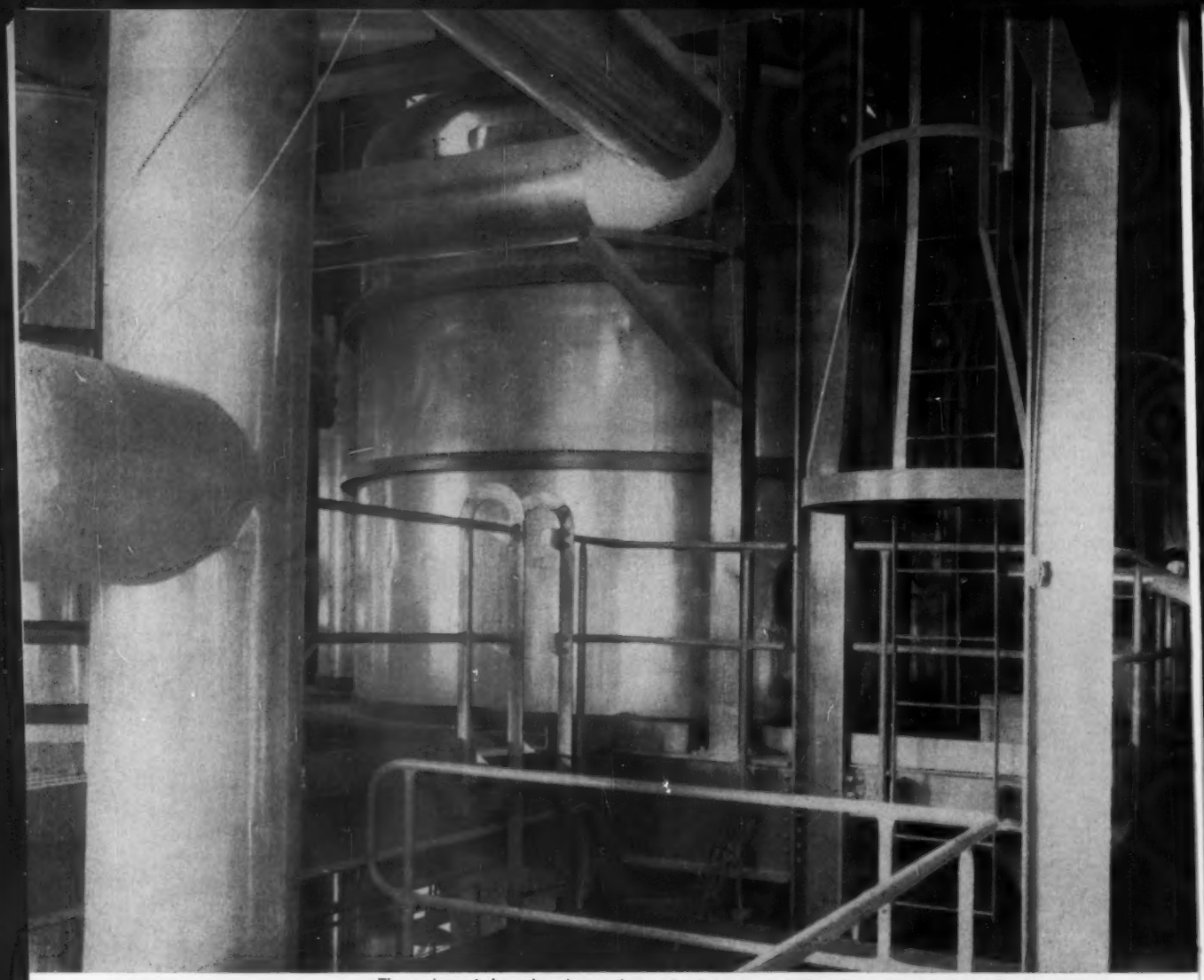
When it comes to building and maintenance of haul roads, the Huber-Warco 5D-190 MOTOR GRADER is a natural. This rugged, powerful (195 h.p.) will open new roads, or smooth out existing haul roads to keep profitable payloads traveling. Big, yet easily maneuvered, the Huber-Warco 5D-190 features a diesel engine, torque converter, tail-shaft governor and power-shift transmission. Once the operator sets the speed the tail-shaft governor maintains it, regardless of load conditions. Operators favor this unit . . . NO CLUTCH . . . hydraulic controls . . . booster steering . . . it's easy to handle. There are many other outstanding features that make all Huber-Warco motor graders the most profitable on the job. See your Huber-Warco distributor for details on the complete motor grader line ranging from 75 to 195 h.p.

A product of HUBER-WARCO COMPANY, Marion, Ohio, U. S. A.

HUBER-WARCO COMPANY, Marion, Ohio, U.S.A.
Send me specifications on the Huber-Warco
☐ 5D-190 ☐ other grader models
☐ Send me the name of my nearest Huber-Warco distributor

Name .....
Title .....
Company .....
Address .....
City ..... Zone ..... State .....
8-EM

HUBER W WARCO



The equipment shown here is one of several unit processes in the refinery where Stainless Steel is required to resist the corrosive effects of the ammonium sulfate and ammonia used in this new extraction process.

Only Stainless Steel is good enough for this new extraction process

at Sherritt Gordon Mines,
Fort Saskatchewan, Canada

Sherritt Gordon Mines, Ltd. has a new method for extracting nickel, copper and cobalt from ore. The ore is dissolved in a bath of ammonium sulfate and ammonia and the metals are recovered from the solution.

Stainless Steel is the only metal that can be used in the pipes, tanks and pumps that give this "hot bath" to the ore. The ammonium sulfate and ammonia would eat away carbon steel, and other materials can't take the high pressures and temperatures in this work.

There is two million dollars worth of Stainless Steel in the plant. Stainless has proved to be more economical than any other material. It's strong and it resists corrosion. It eliminates costly maintenance problems.

If corrosion and replacement of equipment are problems in your work, think about using Stainless Steel. For more information about the application of Stainless Steel in mine work, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS is a registered trademark

United States Steel Corporation–Pittsburgh
American Steel & Wire–Cleveland
National Tube–Pittsburgh
Columbia-Geneva Steel–San Francisco
Tennessee Coal & Iron–Fairfield, Alabama
United States Steel Supply–Warehouse Distributors
United States Steel Export Company

USS **United States Steel**

Sr. Mateos (*Continued*)

would probably move project expansions if there was some tax relief. Right now, the government is giving subsidies to mining companies who can prove that they are losing money or are about to lose money. This comes in the form of rebates of collected export taxes. But industry spokesmen say this rebate business is just a stopgap measure and will do nothing to really put mining back on its feet.

At least one big U.S. company, the M. A. Hanna Co., is looking over properties to be ready if and when the new government makes a move to liberalize mining codes and taxes. Hanna is reportedly eying some big Mexican manganese properties.

About the only bright spot in Mexican mining is the booming sulphur business. Take, for example, Pan American Sulphur's statement for last year. Panam Sulphur had its biggest year in Mexico with its subsidiary, Azufrera Panamericana S.A. producing 723,000 long tons a hike of 100,000 tons over 1956. Thi year, company officials maintain, production should be well over 800,000 tons. Sales for last year were $15.7-million compared with $10-million in 1956 (even with a drop in prices).

Minerals Census Is Due

THE U.S. CENSUS BUREAU will begin a series of six censuses in January 1959, including one of the minerals industry. Statistics, the Bureau said, would be published for each state metropolitan area, city, town and county. Other surveys will cover business, manufacturing and agriculture.

Denver Research Group Claims Oil Shale Success

OIL SHALE deposits in the United States can now be treated in such a way as to produce liquid fuels at competitive costs, according to two members of the Denver Research Institute, University of Denver.

S. A. Johnson Jr., director of the Institute, and Dr. Charles H. Prien, head of its chemistry and chemical engineering division, based their assumption on two years of working on the process for the Oil Shale Corp.

The process involves heating metal or ceramic balls and then revolving them in a retort with the shale. This raises the temperature of the shale to a point where its hydrocarbons are released. The shale is then drawn off and burned in a furnace to reheat the thermospheres.

Oil from Colorado shale could, Mr. Johnson said, be delivered to the Pacific coast at a cost of $1.42 to $1.92 a barrel. He estimated that the cost of a 2,400 tpd plant plus shale mine would come to about $3-million, and that the unit could produce 1,200 to 1,300 barrels of oil per day. The oil, he added, could be treated by normal petroleum refinery methods.

The oil shale process was originally

HUBER-WARCO
motor graders

makes quick work of tough grading

Huber-Warco torque converter MOTOR GRADERS ranging in horsepower from 102 to 195 h.p., have been designed to efficiently handle tough haul road grading assignments. The perfect balance of weight and power permits these graders to move more volume with faster passes and smoother cuts for more profitable operation. A tail-shaft governor maintains speed regardless of load conditions . . . the power-shift transmission eliminates shifting operations. An exclusive feature of Huber-Warco MOTOR GRADERS is the completely cab-controlled hydraulic blade movement. In less than a minute, and without ever leaving the cab, the operator can move the blade from a 90° bank sloping position on one side to 90° on the other. There are NO manual adjustments to be made. In addition to the torque converter models, Huber-Warco also has a line of standard transmission graders from 75 to 123 h.p. Get all the important facts . . . contact your Huber-Warco distributor today.

A product of HUBER-WARCO COMPANY, Marion, Ohio, U. S. A.

HUBER-WARCO COMPANY, Marion, Ohio, U.S.A.
Send specifications on Huber-Warco motor graders.
☐ torque converter ☐ standard transmission
☐ Send me the name of my nearest Huber-Warco distributor.

Name _____
Title _____
Company _____
Address _____
City _____ Zone ___ State _____
8-EM

HUBER W WARCO

SEMI-AUTOMATIC

Vulcan DENVER

HOISTING

Proves Economical In Inter-Level Service Shaft In Arizona Copper Mine

A two-compartment service raise between levels at an Arizona copper mine uses a semi-automatic Vulcan installation which eliminates full time use of two hoist operators and two cagers, and complies with existing mine laws. Selector switches interlocking with geared limit switches and other safety controls permit cage operation from either level or from the cage. A set of by-pass switches permit the lowering of long material suspended under the cage simply and safely.

The Vulcan-Denver hoist is actually a 6,000 lb. two speed winch, with worm gear drive and grooved drum to give 115 F.P.M. high speed and 57 F.P.M. low speed cage travel. Total time between levels is less than 75 seconds. The features of Vulcan design and construction in this case are the same rugged, dependable characteristics that have made Vulcan-Denver hoists and slushers famous for economy and long service throughout the world.

An adaptation of this equipment is driving raises in iron mining. Initial operation by remote control more than doubled the Feet-Per-Man-Shift. No hoist operator needed.

Let us consult on your hoisting application, including remote or automatic control for economical, safe, well adapted operation.

Represented Internationally through DORR-OLIVER, INC., Stamford, Conn., and associated firms.

Vulcan IRON WORKS CO.

IN DENVER SINCE 1891

2960 SOUTH FOX

ENGLEWOOD, COLORADO

Oil Shale (*Continued*)

developed in Sweden but is controlled in this country by the Oil Shale Corp. —they own the Western Hemisphere rights to the process.

Uranium Reduction Goes to Alkaline

EXPENDITURE of between $2.5-million and $3-million on a new alkaline leach circuit at the Moab uranium mill of Uranium Reduction Co., was scheduled in August.

The new circuit is dependent upon a revised contract for sale of uranium concentrates now being completed between URC and the Atomic Energy Commission.

According to Roy Hollis, Moab, Utah, URC plant superintendent, the new contracts will carry sale of concentrates by the mill past 1962 into and through 1966.

Meanwhile, some reduction in reprocessing will be accomplished by the mill, which has been running at virtual capacity in recent years.

Effective by end of July, milling rate was to be dropped to between 1,400 and 1,500 tpd. The milling rate between Mar. 31, 1962 and Dec. 31, 1966, is projected at about 1,000 to 1,200 tpd, depending on ore grade, Hollis said.

The changes will result in a cutback of employment at the mill, as well of uranium ore mining rate by various operators in the Big Indian district of San Juan County, Utah.

Hollis said he did not expect these reductions to be of "any great magnitude," however.

New milling contracts will be signed by the mill with principal producers in the district, upon completion of the AEC concentrates deal.

A factor in the installation of the alkaline leach circuit, which will employ soda ash as distinguished from H_2SO_4 in the two existing acid circuits, is the high lime content of some new properties being brought into mining production in the district.

Hollis said that URC was spending as high as "$8,000 to $10,000 a day" for sulphuric at present.

This acid comes from the Garfield Chemical & Manufacturing Co., Garfield, Utah, a joint affiliate of Kennecott Copper Corp. and American Smelting & Refining Co.

National Research Corp. Is Producing Tantalum

COMMERCIAL PRODUCTION of very high-purity tantalum metal by arc-melting of consumable electrodes is now under way at National Research Corp., Cambridge, Mass, according to Richard S. Morse, president.

"A series of technological breakthroughs climaxing a two-year research program led to a new process for large-scale reduction of tantalite ore to tan-

B.F.Goodrich

B.F.Goodrich tires haul coal uncovered by world's largest shovel

BIG PAUL takes a 70-yd., 105-ton bite of overburden at the Peabody Coal Company's River King mine near Freeburg, Ill. This world's largest shovel towers 147 ft. 6 in., can dig, hoist, swing and dump its load in 50 seconds! The coal it uncovers is hauled by truck to the preparation plant 5 miles away. The road has a rock base—and loads run as high as 80 tons. Peabody assigns this rugged hauling job to B.F.Goodrich Rock Service tires. Here's why:

Rock Service tires are built with B.F.Goodrich FLEX-RITE NYLON cords that withstand double the impact of ordinary cord materials, resist heat blowouts and flex breaks. No wonder the FLEX-RITE NYLON body outwears even the extra-thick Rock Service tread, can be retreaded over and over!

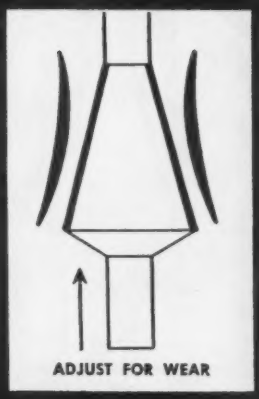
Husky Rock Service cleats grip the ground for positive traction in forward or reverse. The tire is built to flex evenly—no localized strains that cause unnecessary tire failures! See the new B.F.Goodrich Rock Service—tube-type or Tubeless—at your B.F.Goodrich dealer's. He's listed under Tires in the Yellow Pages of your phone book. Ask to see his complete line of tires for every mining job. *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

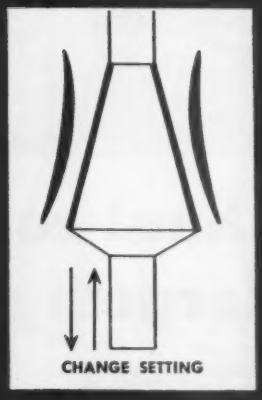
Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment

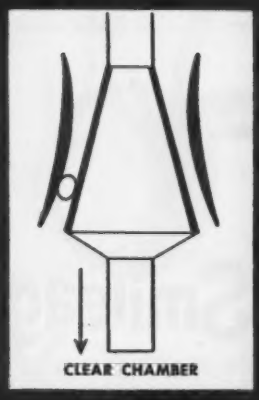
B.F.Goodrich *truck tires*

© The B.F.Goodrich Company

Superior crusher with Hydroset mechanism



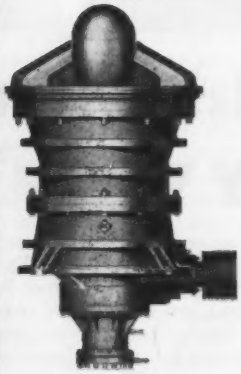




Maintain circuit balance under varying operating conditions

The flexibility of a *Superior* primary or secondary crusher assures you maximum efficiency for the entire circuit under changing operating conditions. You can vary capacity by changing eccentric throw. You can change crusher settings in less than a minute. You maintain uniform product size easily over long runs — by simply flipping a switch to compensate for wear on mantle and concave. Result? Smooth flow of desired tonnage with minimum circuit adjustments — lower operating costs.

Flip the switch



The exclusive *Hydroset* mechanism in the *Superior* crusher raises or lowers mainshaft hydraulically, in less than a minute. This mechanism not only gives you "one-man, one-minute" product control but also helps clear the crushing chamber in case of power failure or other emergency conditions.

Bulletin 07B7870 will give you all the details. Ask your A-C man for a copy, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

A-5606

ALLIS-CHALMERS

Superior and *Hydroset* are Allis-Chalmers trademarks.

Tantalum *(Continued)*

talum metal powder of a purity hitherto unavailable commercially," Mr. Morse said.

"An equally important part of the research—which covered all phases of the tantalum operation from ore to pure metal—was the development of a new type vacuum arc-melting furnace to convert the tantalum powder to large high-density ingots," he added. "The high-purity powder was found to be a key to successful arc-melting, and ingots greater than 100 lb have been produced."

"Production at our Cambridge plant is now up to 30,000 lb per year and, in line with market forecasts, our engineers are designing an expansion which will increase the capacity many-fold," Mr. Morse said. "Consumption of 'electronics-grade' tantalum in the U.S., for example, is roughly doubling each year, and it is expected to continue increasing at about the same rate, according to most reports."

The company is purchasing tantalite ore through established sources in the major mining areas—Central Africa, Western Australia and Brazil. At the present rate of consumption, NRC already has more than a year's supply of ore on hand with ample reserves available.

New Hosco Reports Core

NEW HOSCO MINES LTD., a sensation in stock market activity in early July has issued an assay report on the initial diamond drill hole at its 40-claim group in the Mattagami area of Quebec.

The drill hole returned 77 ft assaying 4.01% copper from a depth of 317 ft to 394 ft, the report states. Of this section, the first 57 ft from 31 to 374 assayed 4.82%.

IN THE U. S.

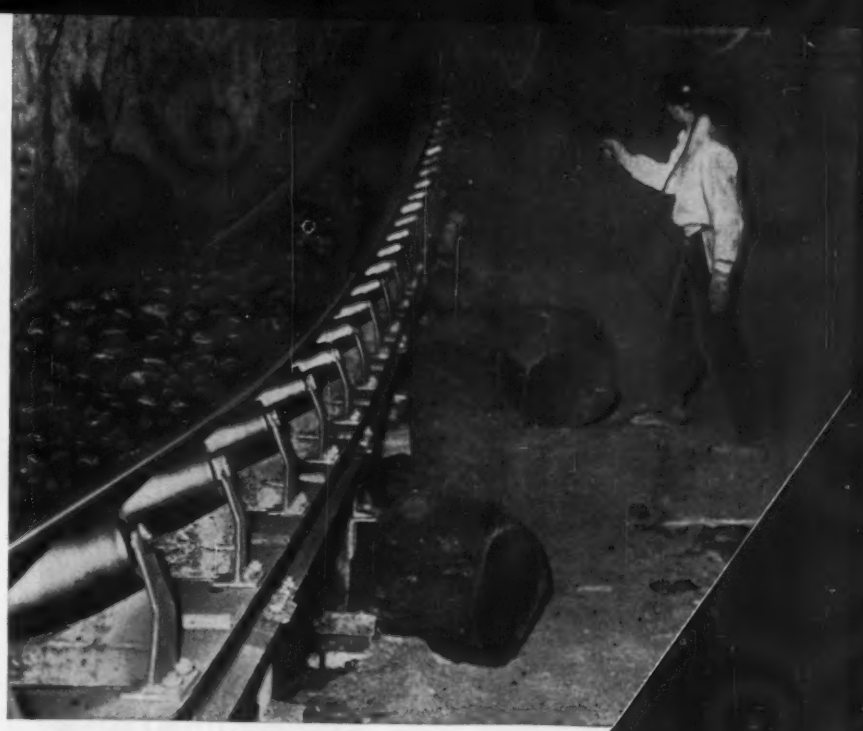
ALASKA

Devamin Co., Inc. has its drilling program well under way on the Yakobi Island nickel deposits. Boyles Brothers Drilling Co. is doing the drilling under the supervision of Devamin Co. geologists. A helicopter is also being used. Yakobi Island is at the northwest corner of Chichagof Island.

It is reported that Pick Mines (Vernon Pick) is operating with a float plane out of Fairbanks prospecting for uranium in the Brooks Range.

ARIZONA

Sidney Mining Co.'s joint venture with Mascot Mines Inc. and Inar Norgaard on the Navajo uranium lease in the Monument Valley District of Arizona has been developed to a self-sustaining basis and is beginning to return funds advanced by the two companies for shaft-sinking and other development ex-



Thermoid Belting

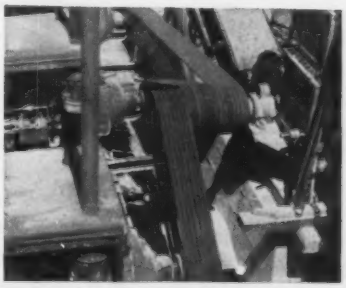
is built to take it... underground!

This is especially true of fire-resistant Thermocoal—the belt that bears acceptance designation #28-13 of the U. S. Bureau of Mines.

You'll not only have a belt that meets or exceeds all after-flame and after-glow tests . . . you'll also benefit from typical Thermoid toughness. Thermocoal Belts are engineered for high resistance to flexing and impact, edge wear, abrasion and mildew. You can specify either 4 or 6 ply construction of the strongest cotton or cotton-nylon duck—impregnated with specially compounded Thermoid rubber stocks to assure longer life, lower costs.

Your Thermoid Distributor can help you select the belting that meets your requirements. Contact him . . . or write direct for detailed information and data sheets.

Make Thermoid your choice, too, for Multi-V Belts . . .



. . . and Hose manufactured with your needs in mind.

Thermoid

Thermoid Company
Trenton, New Jersey
Nephi, Utah

Pat. Applied For

RIDGID Hex Wrench

gives you Time-Saving, Positive, 4-Sided Grip on Hex Nuts, Square Nuts, Valve Packing Nuts, Unions, Gas Cocks

Here's the adjustable wrench you've always needed for hexes, squares and flatheads, rough or finished. Extra useful on every job. No more barked knuckles or rounded nut shoulders. New wide-open jaw goes on easy . . . won't slip off. 4-sided grip gives extra leverage. Stays to adjusted size during use.

Available in 3 Sizes

No. 11, ⅜″ to ¾″—No. 17, ⅝″ to 1¼″—No. 25, 1″ to 2″

Famous RIDGID heavy-duty construction with guaranteed housing. Narrow jaw design makes work easy in tight places even on thin nuts. Comfort-grip I-beam handle has handy hang-up hole. The new RIDGID Hex Wrench gives you more for your money than wrenches costing twice as much. Try it, buy it at your Wholesaler's.

The Ridge Tool Company • Elyria, Ohio, U.S.A.

Arizona (*Continued*)

penses, officials say. Development of a second ore deposit iin the same vicinity is currently under way.

CALIFORNIA

Kern Uranium Co. plans to sink an existing shaft in the footwall of its mine in Kern River Canyon, 45 miles from Bakersfield to the 160-ft level, crosscutting some 55 ft back to the structure and drifting in both directions thereon. The plans are announced along with notice that alleviation of the ore-marketing problem has resulted in the shipment of four cars of ore in recent months.

The cars contained 206.33 tons of ore and assayed, at the Vitro mill in Utah, an average of 0.52% U_3O_8, Lloyd Scouler, president of the company, reports. He adds that his company recently "reached a generally satisfactory tentative agreement with the mill with regard to rate of future shipments. They have expressed a wish to take regular deliveries, provided we will not take quick production at the expense of mine development work."

Operations at the mine now include stoping out blocked-out or at 60-ft.

Kern Uranium has been most unhappy with the AEC's "stretch-out" of uranium ore production in the U.S., despite a presumably guaranteed market, Scouler says. "The standby basis on which the mine has been since last November has been very costly and frustrating," he says. "Nevertheless, we believe the long-range economic future of the industry is sound and because of the tentative guarantees to take a reasonable amount of our indicated potential production, we are planning to reopen the mine."

Recent ore shipments came from the mine stockpile, produced from the first level last year.

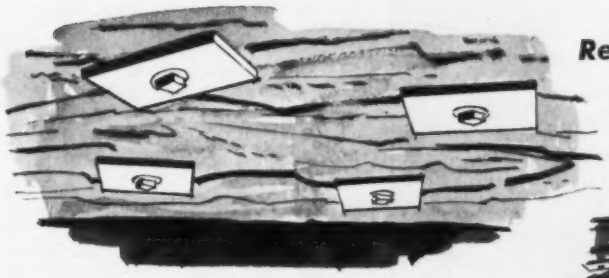
A project to determine surface rights in the Kern Plateau Area in Tulare County northeast of Bakersfield got under way recently, forest supervisor Joseph Radel of the Inyo National Forest announced. The project area is in the Mt. Whitney Ranger District.

Abandoned, inactive, invalid and unidentifiable claims are being examined and a reasonable effort made to determine the persons in actual possession of or engaged in the working of such land. The field search will be completed in about two months, it is announced.

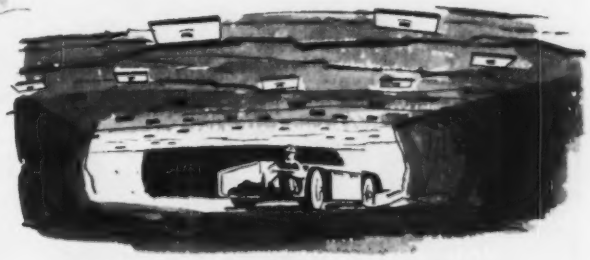
The Rosamond Mining Co. is readying 75 tons of uranium ore to be sent to the Vitro mill at Salt Lake City, Robert Donovan, president of the company, reports. The mine is situated 5½ miles west of Rosamond on Dono-Han claims (freed of litigation by a judgment in favor of the current operators by the Fourth Court of Appeals in Fresno, April 1956.)

Production is from a 50-ft shaft on an anomoly discovered by the AEC in 1954 and, independently, by Donovan and Christian K. Hansen. Glenn A. Brown

Here's why it pays to bolt your roof

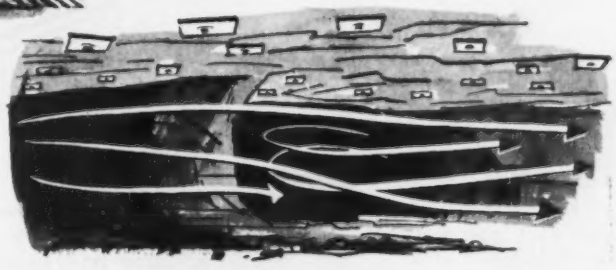


Reduces rock falls . . . improves safety

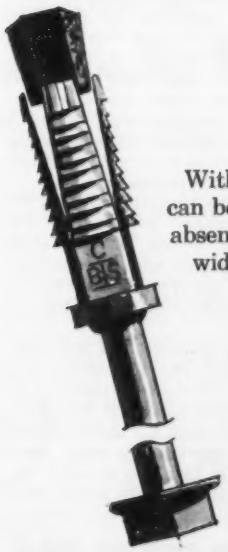


Permits wide haulageways . . . increases clearance

Makes mechanized equipment easier to maneuver



Improves ventilation . . . no bulky supports to store



With roof bolting, mechanized equipment can be worked close to the face, due to the absence of bulky supports. In addition to permitting wide openings and clearances, roof bolting also improves ventilation . . . minimizes the need for storage space . . . eliminates fire hazards.

Bethlehem Headed Roof Bolts In 3 Diameters

To meet virtually every roof condition, Bethlehem makes headed roof bolts in 3 diameters: $\frac{5}{8}$ in., $\frac{3}{4}$ in., and $\frac{7}{8}$ in., having typical breaking loads of from 24,000 lb for the $\frac{5}{8}$-in. bolt to 45,000 lb for the $\frac{7}{8}$-in. bolt.

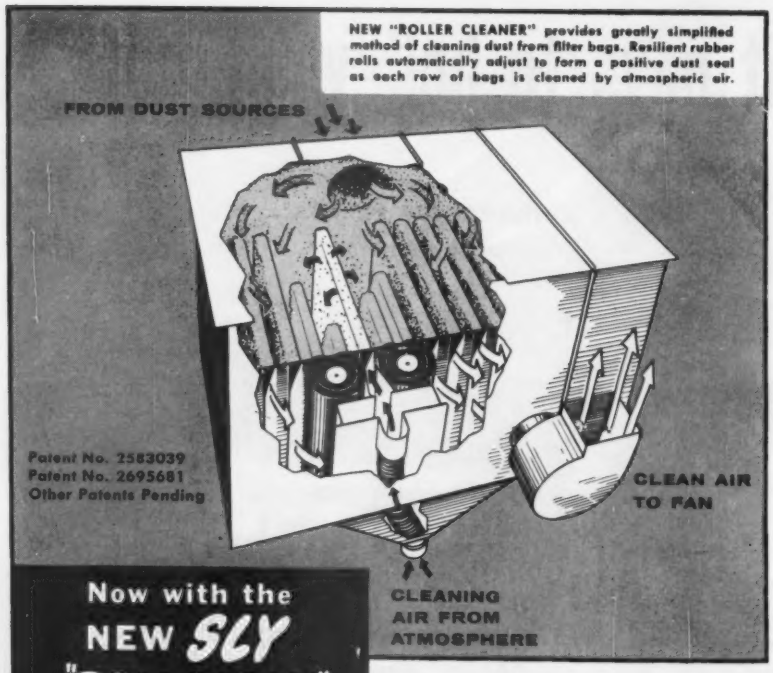
If you'd like to know more about roof bolting, write us at Bethlehem, Pa., and we'll have a representative call at your convenience.

SLOTTED BOLTS, TOO. For use in certain types of rock, Bethlehem also makes a 1-in. slotted roof bolt, which is used with a steel wedge. Ask for details.

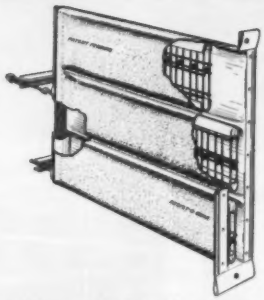
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL


NEW "ROLLER CLEANER" provides greatly simplified method of cleaning dust from filter bags. Resilient rubber rolls automatically adjust to form a positive dust seal as each row of bags is cleaned by atmospheric air.
FROM DUST SOURCES
Patent No. 2583039
Patent No. 2695681
Other Patents Pending
CLEAN AIR TO FAN
CLEANING AIR FROM ATMOSPHERE

Now with the NEW SLY "ROLL-CLEAN" DYNACLONE



As much as 3 TIMES LONGER BAG LIFE

NEW SLY "RESIST-O-WEAR" FILTER BAGS (patent pending) provide complete dust filtration with as much as three times longer life than conventional bags. This has been proved on the toughest field installations.

The new bag has three equal-size sections. Each pocket has two spacers, making a total of six per bag. Weight is distributed on three seams rather than one, minimizing strain. A special protective flap on the back end prevents abrasion from incoming dust.

Now standard in the new "Roll-Clean" Dynaclone, Sly "Resist-O-Wear" bags combine with all the other superior Dynaclone features to assure greatest dust collecting efficiency with unequalled maintenance-free service.

ALL THESE FEATURES IN ONE DUST FILTER

- New "Resist-O-Wear" bags last as much as three times longer.
- Constant suction at dust sources—complete dust collection.
- Automatically self-cleaning for continuous operation.
- Free-rolling cleaner. Complete dust seal—automatic seal adjustment.
- Greater filtering capacity; smaller space requirements.
- Simplified construction for ease of inspection and servicing.

SEND FOR New Bulletin 105 and New 36-page Dust Control Catalog 104.

SINCE 1870 SLY

THE W. W. SLY MANUFACTURING CO.

4758 TRAIN AVENUE • CLEVELAND 1, OHIO
OFFICES IN PRINCIPAL CITIES

California (*Continued*)

is the geologist for the company. A headframe, hoist house, sampling room and office building have been constructed at the mine.

Autonite and uranophane ore assays run as high as .51% U_3O_8, operators report.

Plans call for digging a 300-ft shaft, and for drifting at 100 ft.

Twelve deep exploratory trenches have been dug in the mine area, an altered andesite porphyry dike with intruding quartz monzonite one mile in length.

Great Lakes Oil & Chemical Co. has resumed exploratory operations at the Kergon mine near Miracle Hot Springs in the Kern River Canyon, company officials report. Tied up previously in litigation, the Kergon mine is credited with making the second carload shipment of uranium ore from California.

COLORADO

Vanadium Corp. of America closed its uranium mill at Naturita, Jan. 31, and is now virtually closing its ore buying and sampling station at the site. Denny Viles, vice president of VCA, said the firm isn't stopping purchase of ore, but is trying to close out the buying station and sampling plant at Naturita. "It's just double handling," Viles commented about the plant operation.

"We're transferring all ore to Durango," he said, "but we're still buying the full amount under contract—about 50% of the total." If necessary, he said, the buying station at Naturita will be reopened, although at present he can "see no reason for it." About 15 men are presently employed at the plant and most have received word they're being terminated."

The Naturita mill, until closed in January, was the oldest operating uranium mill on the Colorado Plateau. A new VCA-government contract allows the Durango mill to be rebuilt to process about 750 tons of uranium ore daily.

Capacity at the Naturita mill was 350 tpd and at Durango is now 430 tpd. One new roaster at the Durango plant is already completed and in operation, Viles said, and the rest of the construction is on schedule. Completion was set for early July.

Mining in the Naturita area is to continue, Viles said, and all ore is still being accepted. Of the men laid off at the sampling plant most will find work in mining, Viles said. Of those laid off when the mill was closed, many were asked to come to Durango to work but told VCA they had already found work in the Naturita area.

Gold receipts at the Denver Mint in May totaled 67,773 oz worth $2,322,066 compared with 55,662 oz worth $1,148,165 in May 1957, mint officials report.

Silver receipts were up to 833,530 oz valued at $754,261 from 13,581 oz valued at $12,307. Within the past year the world price of silver has fallen below the U.S. Government's fixed price

50% FASTER WITH AIR POWER

Half Century of Dependable Service

NOW.. the 'Canton' Air-Power Car Transfer

BOOTH 625

San Francisco Show

—for Single Track Loading—fast

Also self-liquidating: Track Cleaners, Rock Dusters, Electric Switch Throws, Automatic Mine Doors, Cable Splicers and Vulcanizers. See our 2-color full page ad in Engineering and Mining Journal Guide Book.

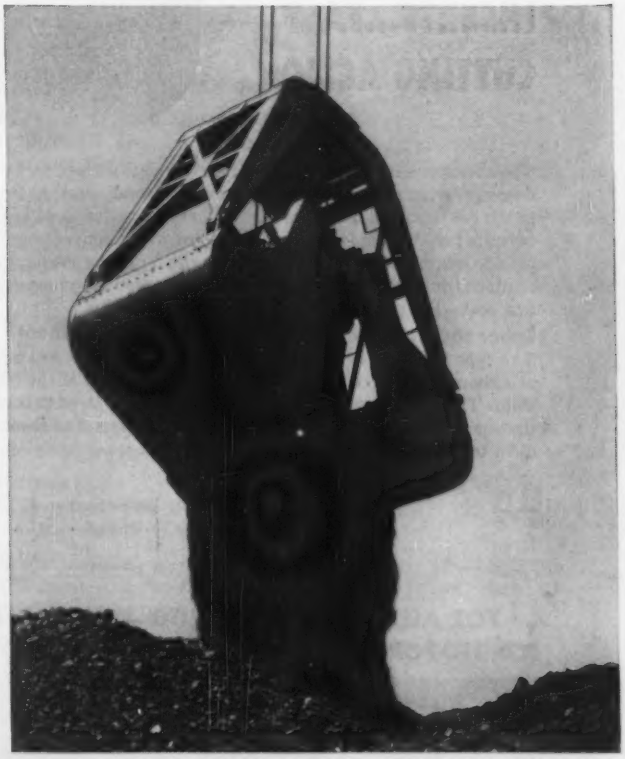
Now—one man does the work of three.

Cars shuttled transversely back and forth to clear track while loading empties. "Canton" Car Transfer quickly re-installed to new track location a trip length out-by loader . . . no alteration of track . . . eliminates expensive slabbing for double tracks or for California switch. No more hazards of cherry picker. Motorman *pulls* empties in, *pulls* loads out. The "Canton" Car Transfer loading cycle is fastest for most profit. Write for quotations *new* units, and *converting* your present units to Air Power.

The AMERICAN MINE DOOR CO.

2039 DUEBER AVE., CANTON 6, OHIO

Blaw-Knox 4-rope Ore Buckets for low-cost fast handling



Blaw-Knox 4-rope Ore Buckets are designed and built for heavy duty service. Upper and lower sheave assemblies are completely assembled independent of the bucket. The upper assembly is equipped with close packed anti-friction bearings for maximum stability.

Scoop hinge members are ruggedly built to withstand severe side bumps and retain true alignment. Geared hinge-type corner bars are of welded construction reinforced with angles at the outer rear corners.

A Blaw-Knox bucket engineer will be glad to discuss your materials handling problem and help select the bucket best suited to your needs.

WRITE TODAY! Bulletin 2392 contains valuable information on Blaw-Knox 4-Rope Buckets for ore handling.

BLAW-KNOX COMPANY

Blaw-Knox Equipment Division

Pittsburgh 38, Pennsylvania

BLAW-KNOX

BAUXITE from Surinam is unloaded at the docks at the new Ormet alumina plant in Louisiana. Full capacity production is expected sometime in the late summer.

LIDDICOAT

. . . the tungsten carbide bit that needs no resharpening

SPECIAL LONG LIFE INSERTS...FAST CUTTING ACTION

PATENTS APPLIED FOR

The exclusive shallow long life inserts need no resharpening because they do not develop a reverse taper dullness . . . a condition that stops drilling in the conventional multi-use bit. The exclusive design of LIDDICOAT permits fast drilling far beyond the point where conventional multi-use carbide bits must be withdrawn from service for resharpening. Fast drilling continues during the entire bit usage without need of resharpening. Lower first cost — low cost per foot of hole drilled.

Taper socket — No threads — Fast, firm attachment

The type TS Tee Cee Liddicoat (no resharpening) bit has a completely new short taper socket connection. Within the socket of the bit is a brass shim. The socket, which is completely forged, is tapered to correspond to the taper placed on the drill rod. The connection assures an absolute attachment to the rod, and yet permits easy removal.

FOR ALL SIZES OF DRILL ROD — 7/8" TO 1½"

FORGED FOR TOUGHNESS FROM NICKEL ALLOY STEEL

WESTERN *Rock Bit Manufacturing Company*

552 West 7th South • Salt Lake City 1 Utah

Ormet Opens New Alumina Project

FULL-SCALE PRODUCTION from the Ormet Corp. alumina plant at Burnside, La. is scheduled for late summer. The $55-million plant began production in late June, ranking fourth in the U.S. list of producers, with 345,000 tons of alumina per year capacity when the second unit goes into production.

Ormet is owned by Olin-Mathieson and Revere Copper and Brass. Bauxite for the property is supplied under a long term contract with Surinam producers via specially-built ore ships of 14,000-ton capacity.

The plant at Burnside will supply alumina to Ormet's reduction plant at Clarington, Ohio, a $110-million plant which started production in June. Covered barges convey the alumina from Burnside to Clarington.

Colorado *(Continued)*

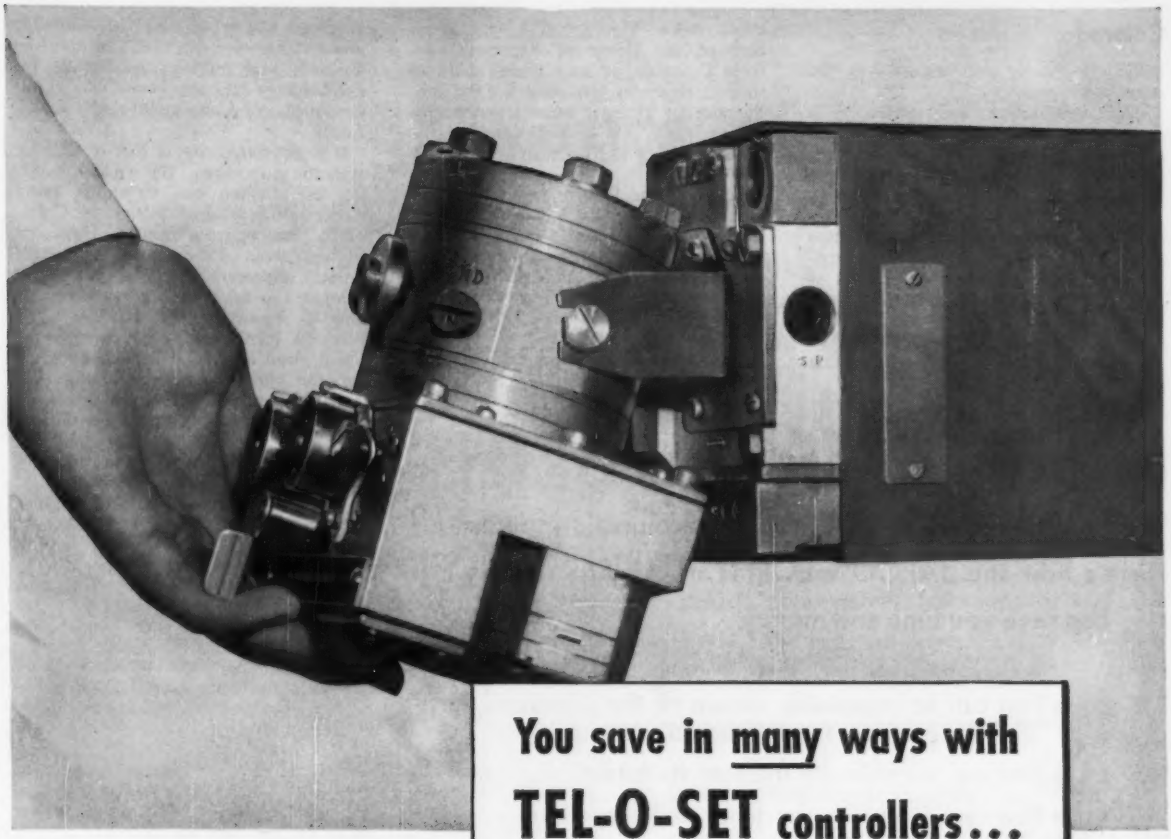
of 90½ cents an oz, resulting in a large flow of the metal to the Government. **A Salt Lake City attorney representing some 20 small mining companies with assessable shares, has protested** proposal of the Securities & Exchange Commission to place stock assessment on the same plane as underwritings controlled by the SEC.

At Alma, Charley Jordan has closed down his Buckskin Joe Mine. Among the things he had to say about the plight of the small mining man and the industry in general, the following stand out:

"It is economic suicide to try and operate a mine at the present prices paid for lead and zinc. Present legislation under consideration by Congress is inadequate to stabilize the mining industry and it is doubtful that the large operators want a subsidy which will in any way put the small operators in a position to compete locally."

"With one exception, all of the large producers of lead and zinc have foreign concessions operating under a favorable labor market."

A. Roy Wicker has been elected president of the Colorado Chapter of the RAM, an auxiliary of the Denver Mining Club. These initials are known in polite



You save in many ways with TEL-O-SET controllers...

...today's most advanced pneumatic controllers

Control any process variable with a simple yet highly sensitive *Tel-O-Set* controller. Get all the high-performance characteristics you expect from a modern controller . . . plus specific savings.

CUT INSTALLATION COSTS
- Quick-connect assembly makes controller mounting easy.
- Mounting manifold preserves quick-connect and bumpless transfer features.

CUT SPARE PARTS INVENTORY
- Only one basic controller needed for all applications.
- Add rate action easily for more complex processes.

REDUCE PROCESS DOWNTIME
- Process remains on manual control when controller is removed.
- Unique design eliminates start-up overshoot.

SAVE MAINTENANCE
- Foolproof reassembly after cleaning and servicing.
- Repairs easily made by any maintenance man.

Get complete details on controllers and other *Tel-O-Set* instruments from your nearby Honeywell field engineer. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

Honeywell

First in Controls

REFERENCE DATA: Write for Catalog C100-1A, "Tel-O-Set Indicators, Recorders, Controllers".

Colorado *(Continued)*

circles as "Rally All Miners"—to the support of gold.

The organization was started at a recent Colorado Mining Association convention and now is cooperating with the people who have been fighting long and hard for gold backing for paper money.

The Denver Mining Club at its weekly session in Denver unanimously adopted the resolution below as part of its continued effort to change the weakness of Washington in allowing foreign mines to swamp the U.S. market with foreign ore and cause the closing of our mines:

"Resolved that the Denver Mining Club contact U.S. Senators, and Members of the House of Representatives from Colorado, at once urging them to support measures providing for the continuance of Defense Minerals Administration, preferably as a Division of the Department of the Interior."

Officials of the Golden Cycle Corp. of Colorado Springs are hopeful that their recent application to the AEC for a uranium milling contract may be approved. Though pending, their application is still under consideration while others have been rejected. Should the application be approved, it would permit the company to expand the Carlton Mill for the processing of Colorado Front Range uranium ore. The necessity for additional milling capacity for the Front Range ores was stated in a public announcement made by AEC the first of April.

It is estimated that a mill of 200-ton capacity is required. The greatest quantity of uranium ore from the Front Range comes from Tallahassee Creek, which lies between Canon City and Guffey, about 15 miles from Cripple Creek. However, three shipments of uranium ore have been shipped from as close by as the top of 4-Mile Hill.

If the AEC application is granted, it will mean a major expansion program for the present refining mill. The sampling plant and the grinding section of the Carlton Mill could be utilized for both uranium and gold, officials say, but beyond that the expansion would in effect create two mills under one roof. At the present time the mill employs 36 men.

Alfred G. Butler, president of the Silverton Mining Co., Silverton, has power equipment working to open up a new lower portal to his Mighty Monarch claims. This is being done to avoid a snow-slide area, where his present two tunnels are located. This work, he says, has just opened a vein 15 to 20 ft in width with talc-seams one foot wide on each side.

A recent U.S. Geological Survey of that area reports this could be the famous Titusville vein which could penetrate through the ground of the Silverton Mining Co.

Emperius Mining Co. at Creede, closed down its mine and mill operation. The general shutdown on the mine and mill, the first time in 25 years, will take a $25,000-a-month payroll out of Creede and the San Louis Valley.

Ty Poxson, president of the mining company, said "re-opening of the mill will depend on Washington."

The $13-million production mark at the Carlton Mill at Cripple Creek has been passed with the shipment of gold bricks number 403 and 404 by Golden Cycle Corp. to the mint in Denver. The mill has been in operation since May 1951.

The greatest amount of gold ore processed by the mill in any year was $2,002,501 in 1953. Since that time the annual production has gradually decreased with production total in 1957 of $1,645,271. However, on the basis of the figures for the first four months of 1958 it is expected that a total production for this year will show some increase. As of the first of May, the mill had processed more than a half million dollars worth of gold. Average value of the ore processed this year is $14.88 per ton. Approximately 24% of the ore received is dump ore with the rest classed as mine ore. In 1957, the average value of the mine ore was $17.06 per ton and the dump ore ran $4.90 per ton.

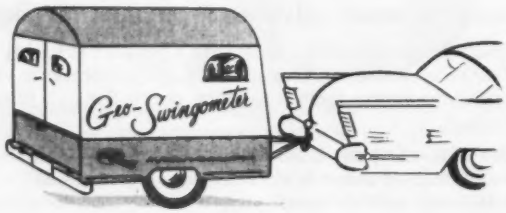
Allen E. Jones, manager of the Grand Junction Operations Office of the AEC, says "the uranium industry by today's standards or any other standards must

CHECK before you DRILL!

You can't afford to waste your exploration dollar.
Here's how the JAECO GEOPHYSICAL SERVICES
can save you time and money . . .

- You can be reasonably certain of the presence of the geologic formation you are seeking.
- You can scientifically measure its extent.
- You can determine its depth and disposition.
- You can determine the order of rock strata in a given area.

SAND
GRAVEL
WATER
ROCK
OIL
CAVITIES
ORE BODIES



The GEO-SWINGOMETER . . .
Can be operated anywhere on land or water. It consists of a completely portable unit employing a controlled one-cycle reversing current, which specifically locates minerals and liquids by use of earth-resistance measurements.

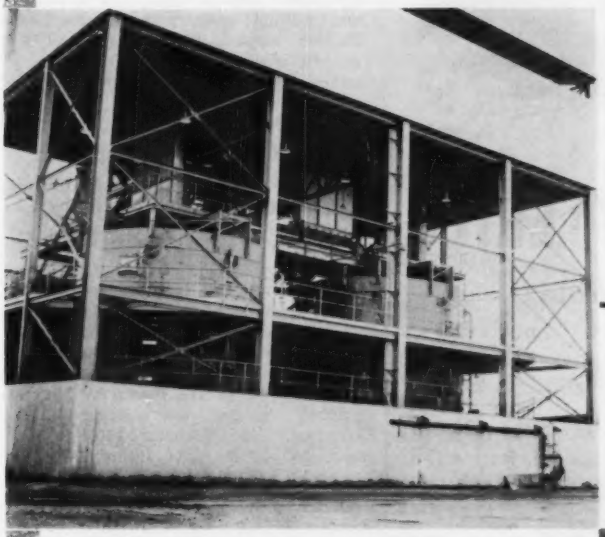
If you want more information for your dollar without a drilled hole

CONTACT —

JAECO
GEOPHYSICAL SERVICES DIV.
P. O. BOX 10
MORRISTOWN, NEW JERSEY
(Phone JEfferson 8-9100)

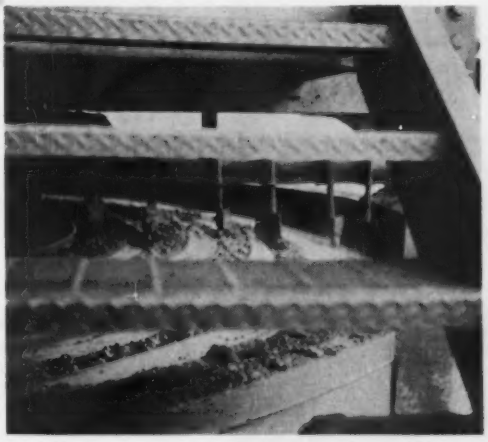
38 years of proved performance...

Skinner Furnaces



Installation in a southwestern U. S. copper company. Two 23'-6" I. D. 4-hearth Skinner Dryers. Each unit is drying over 20 tons per hour of copper sulphide concentrates from approximately 15% moisture content.

Looking into upper hearth, showing rabble arms raking concentrates into the next drying hearth.



Proved performance means wide experience to economically solve your roasting and drying problems.

Skinner

for ROASTING...
- SULPHIDE
- OXIDIZING
- REDUCING
- CHLORIDIZING

for DRYING...
- ORES
- CLAYS
- LIMESTONE
- LIME SLUDGE

COLORADO IRON WORKS CO.

3800 Race Street • Denver, Colorado

AKINS CLASSIFIERS • SKINNER ROASTERS • LOWDEN DRYERS

Sales Agents and Licensed Manufacturers in Foreign Countries

A SUBSIDIARY OF THE MINE & SMELTER SUPPLY CO.

EXIDE-IRONCLAD BATTERIES

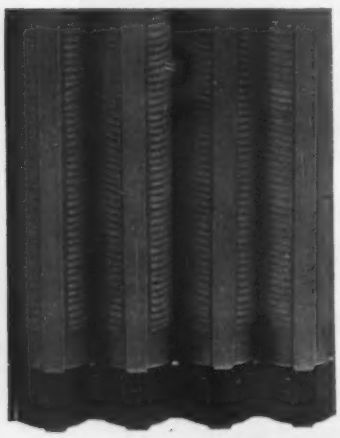
—best buy for the long haul

More ton-miles per dollar—that's the reason most cost-conscious mine operators prefer Exide-Ironclad Batteries for mine locomotives.

Experience has proved over the years that no other battery make matches Exide-Ironclad for average life in service and tonnage hauled. Rating for rating and dollar for dollar, Exide-Ironclad gives you more real value . . . more return on your investment.

Today's Exide-Ironclad features improved tubular construction, making it even better than the models that chalked up the industry's records. So you can expect even longer life potential and superior performance.

Total work output, not mere price, is the key to battery economy. When you buy batteries, specify Exide-Ironclad and get the most production capacity your dollar can buy. For details, write Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.



High-capacity, long-life tubular construction. Gives positive plate one-third more surface area for greater power reserve. Power tubes hold active material securely for long battery life.

Exide®

Colorado *(Continued)*

be considered a substantial industry. By mid-1960 the rate of production of uranium concentrates will be on the order of 20,000 tons. This annual rate of production will amount to $320- to $360-million per year."

San Juan County's only uranium operation, the Long mine at Elk Park, is making progress on a development project which will include a 450 ft tunnel. Clyde H. Long of Colorado Springs, who located the group of claims two years ago, said a trial shipment of 15 tons of ore has been made. Mr. Long said the ore from exploratory cuts ran as high as 35% uraninite.

Loveland's mushrooming beryl mining and milling industry has been given another boost with the announcement of the formation of an area beryl miner's association. The organization was set up as a non-profit group with Loveland area resident William Dansby as the first president. Dansby said this association is the forerunner to a five-state association. Representatives from surrounding beryl states convened in Loveland June 28 to establish the association.

The Beryl Miners' Association has as its objectives the free interchange between members of technical information, including engineering methods, finance and development of individual mine properties and marketing of beryl.

Another beryl mill, owned by Mineral Concentrates Inc., now is being built in Loveland and is scheduled to go into operation in the near future.

Estes Park Beryllium Corp. of Loveland, announced it will build a mill on its beryl ore properties near Drake, Colo., in the Crystal Mountain area.

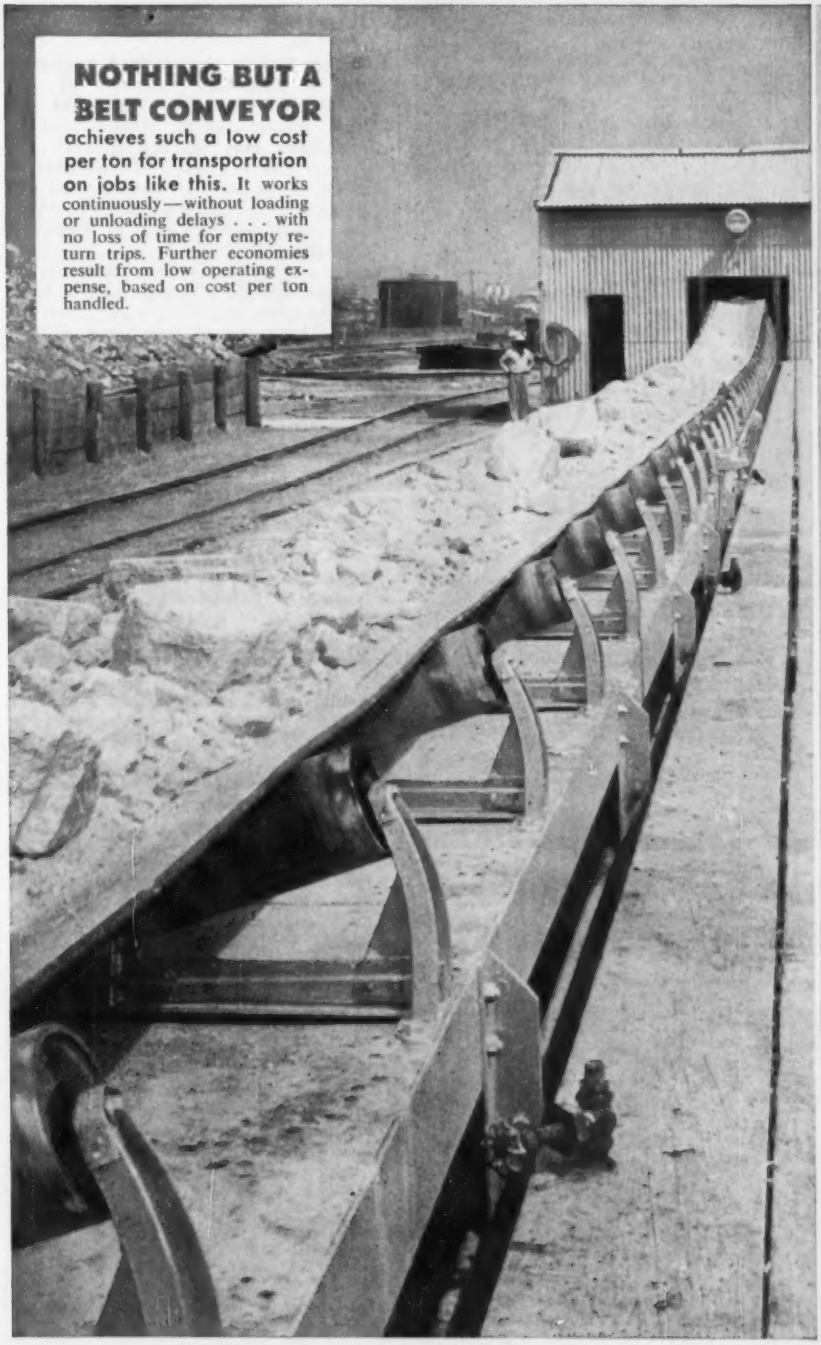
This is the second beryllium mill in the area. American Beryl Corp. announced May 7 it had started milling of beryl ore at Masonville, Colo. American Beryl said its mill was processing 100 tons of raw material daily but concentrate production was not announced.

Estes Park Beryllium said its mill be able to handle 200 tpd of raw material. William Dansby, president of the Estes Park firm, said the new mill would be operated as a joint venture with the Cordillera Mining Co., Dallas Tex.

A new sign at the Old Shenandoah Dives mill, east of Silverton, indicated that the mill would be ready for operation by mid-July.

The plant, containing some of the most modern-type of selective-flotation equipment, is capable of milling up to nearly 1,000 tons in 24 hours. The mill reportedly should have a minimum of 500 tpd to make an economical operation.

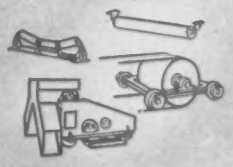
While sources of ore to feed the mill are not yet known generally, it is reported that a large tonnage of broken ore at the Old Hundred mine is scheduled for early milling. Tailings from the Silver Lake, on which the company has a lease, could well supply adequate tonnage for the mill after equipment has been installed to transfer the material from lake bed to the mill.



NOTHING BUT A BELT CONVEYOR achieves such a low cost per ton for transportation on jobs like this. It works continuously—without loading or unloading delays . . . with no loss of time for empty return trips. Further economies result from low operating expense, based on cost per ton handled.

. . . AND NO ONE BUT LINK-BELT offers such complete service for engineering belt conveyors. Calling on unequalled depth of experience, Link-Belt can do a quick but thorough job of analyzing your requirements . . . back up recommendations with a complete line of equipment.

OVERALL ENGINEERING



COMPLETE EQUIPMENT

SKILLED ERECTION

ASSURED SATISFACTORY PERFORMANCE

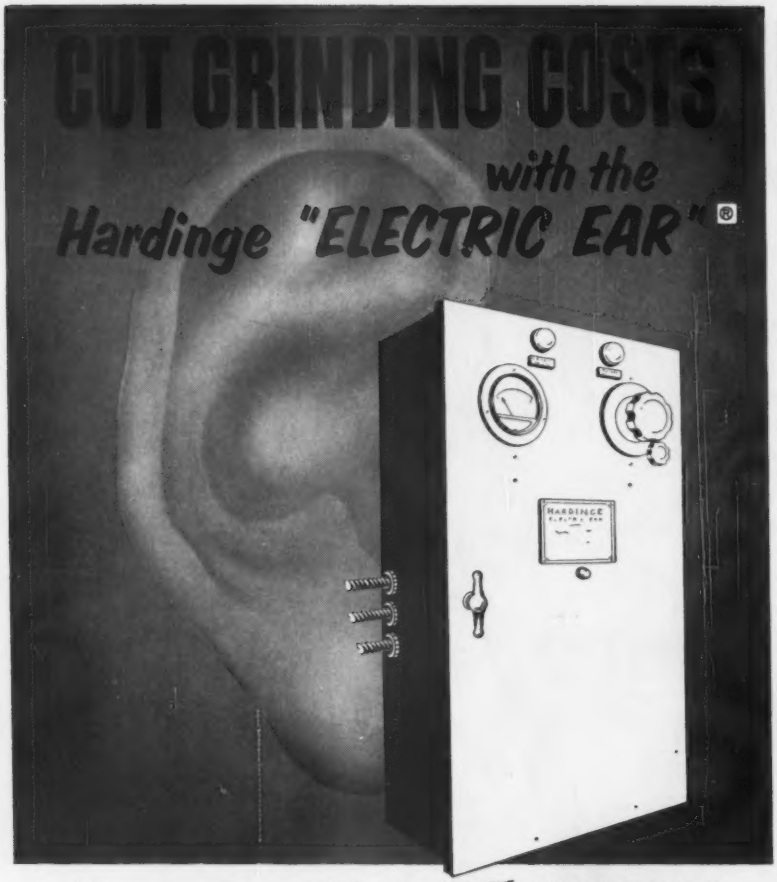
No wasting of engineering manhours on details . . . no need to exchange drawings with scattered suppliers with Link-Belt handling your belt conveyor installation. You get all equipment from one source . . . the specialization that only industry's most comprehensive line of idlers—plus pulleys, drives, terminal machinery and auxiliary equipment—can offer. From design through erection, Link-Belt takes on total responsibility. Our nearest office has full information.

14.780

LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World.



Users report 10 to 15% INCREASE in their GRINDING MILL CAPACITY

In a recent survey of Hardinge "Electric Ear" users, many of them reported 10% to 15% increased grinding mill capacity after installing an "Electric Ear." This unit controls the mill feed, based upon grinding sound level, to produce optimum grinding conditions.

Here are a few typical statements from satisfied customers:

"This unit is doing a remarkable job. It reduces steel and liner consumption. We estimate a savings, with our two units, of $6000 per year on grinding balls and liners. Capacity gained 10%."

"Approximately 25% gain in capacity."

"Helps prevent plug-ups."

"Maintains uniform mill load. Estimated gain in capacity 10%."

"We feel this unit is essential to our operation from a proper quality control standpoint. We would not be able to keep up our present rate of accelerated production and quality without it."

"'Electric Ear' is helpful when inexperienced grinders are learning to operate the mills."

"Eliminates human element in mill feed level."

"Saving per year—$10,000.00."

"Principal reason for 'Electric Ear' use is that it aids the operator, and the mill can be operated from a remote panel."

Write for Hardinge Catalog No. 42-A—1.

HARDINGE
COMPANY, INCORPORATED

YORK, PENNSYLVANIA • 240 ARCH ST. • Main Office and Works
New York · Toronto · Chicago · Hibbing · Houston · Salt Lake City · San Francisco · Birmingham · Jacksonville Beach

IDAHO

Bunker Hill Co. has notified employees that a temporary shutdown of the Bunker Hill and Star Mines and the lead smelter during August and/or September may be necessary if the present adverse marketing conditions for metals continue. The company has extremely large stocks of both lead and zinc metal on hand—well in excess of $5-million worth—and stocks are continuing to increase month by month at the present rate of production. A temporary suspension of operations will be unavoidable unless "corrective action" is taken by the Government in the near future, president John D. Bradley said.

Lucky Friday Silver-Lead Mines Co. has opened what may be a new vein of rich lead-silver ore on the 3,050-ft, bottom level of its Lucky Friday Mine in the Coeur d'Alene District east of Mullan. The new structure was encountered in the south crosscut from the shaft at a point about 150 ft north of the estimated position of the main vein on the lower horizon. It showed about 7 ft of ore, with 3½ ft of good high-grade, at the point of intersection. A westerly development drift is now in progress and is exposing substantial widths of ore similar in character and quality to that found in the main vein on upper horizons. The crosscut has been continued about 80 ft beyond the vein and diamond drilling has been started to determine whether the main vein is in place on this new level.

Sunbeam White Sands Inc. of Moscow has announced plans for construction of a $300,000 plant at Lapwai, to produce silica sands at the rate of about 62,000 tons annually. The company was organized two years ago to do test work at a nearby sand-pit with the view to furnishing filter sand to the Hanford, Wash., atomic works plant and sand-blasting material for the Bureau of Reclamation. Company officials say the pit is the only one in the Northwest suitable for blast sand production because it is basically free of iron. They also say there is no plant in the U.S. now actively producing filter sand. All of this material is being imported.

Development of a substantial length of good silver-copper ore of mineable width and grade in the new east drift on the 3110-ft level of the Alhambra vein in the Crescent Mine on Big Creek between Wallace and Kellogg has been reported by Bunker Hill Co. The ore mineralization is "spotty" but very high-grade in places and in sufficient quantity to be mineable over most of the 200-ft length opened so far. An east drift from the raise to the 2500-ft level is now being driven to explore the area above the ore shoot.

Hecla Mining Co. has resumed exploration and development work at the old Livingston property of Idaho Custer Silver-Lead Mines Inc. in the Boulder District of Custer County under the operating agreement concluded last year. Compressors, a generator and other

LESS DOWN-TIME WITH "JIMMYS"

24 GM Diesel engines operating at Anaconda Company's Jackpile uranium mine

One of the largest uranium strip mines, Anaconda's Jackpile mine in New Mexico employs GM Diesel power in 3 Koehring Dumptors, 2 LeTourneau-Westinghouse Tournatractors, a Koehring Model 605 shovel, a Bucyrus-Erie 71-B shovel and 17 Euclid hauling units.

Mine Foreman Basil F. Barlow says: "I have been supervising the operation of our various GM Diesel engines for the past five years with the Anaconda Company. I have found these engines very efficient, dependable and reliable. *We have less down-time with 'Jimmys'.*"

Clean, simple, 2-cycle design and removable subassemblies make GM Diesels the easiest of all to maintain. And, because of high interchangeability, a single inventory of basic parts protects all engines in a fleet—regardless of number of cylinders. Ask your GM Diesel distributor for the facts—and you'll see why it pays to *specify GM Diesel power in any equipment you repower or buy.*

DETROIT DIESEL ENGINE DIVISION OF GENERAL MOTORS, DETROIT 28, MICH.

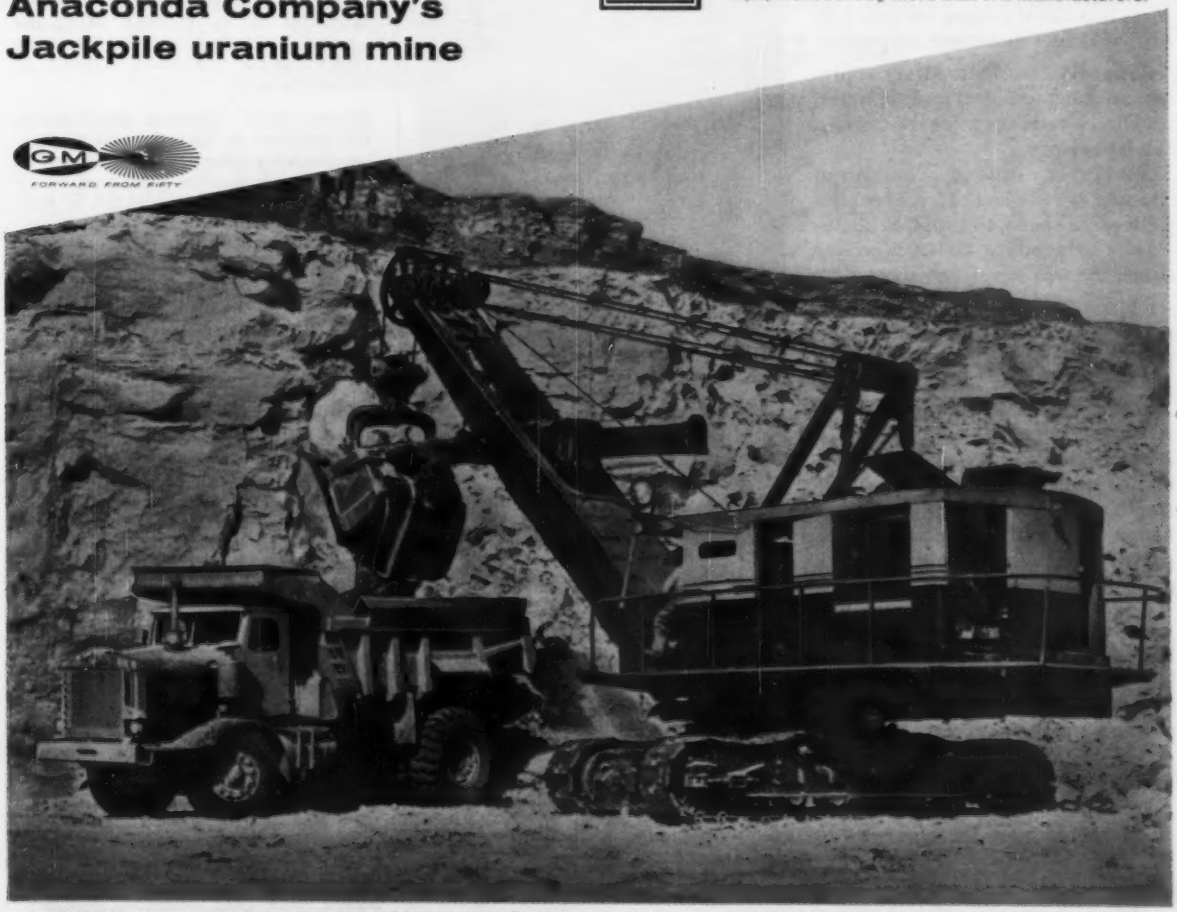
GM GENERAL MOTORS DETROIT DIESEL POWER

Regional Offices: New York, Atlanta, Detroit, Chicago Dallas, San Francisco

In Canada: GENERAL MOTORS DIESEL LIMITED, London, Ontario

Now—more than ever—it pays to standardize on GM Diesel—available in 1485 applications of power equipment built by more than 175 manufacturers.

GM FORWARD FROM EIGHTY



GM Diesel-powered equipment at Anaconda's Jackpile uranium mine includes "71-B" shovel and "Euc 63TD."

Uranium floc holds up

when mixed this way

At this uranium mine, mixing could have been a serious problem.

In the mill's 16 x 20-foot precipitation tanks, alkali had to be dispersed quickly in the ore to produce uniform pH.

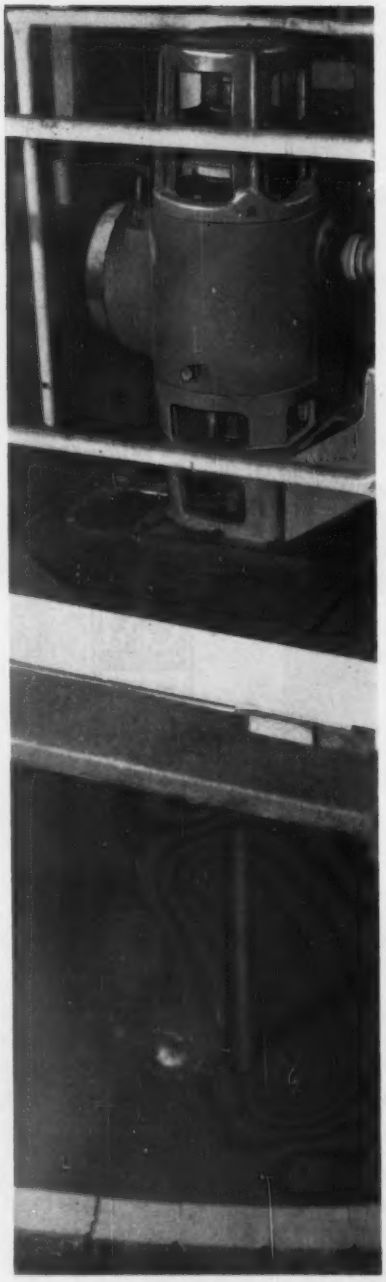
But mixing had to be *gentle*—or the delicate uranium oxide floc would break down into a powdery mass that could gum up the mill's filters and cause disastrous stoppages.

Solution: A LIGHTNIN Mixer representative made notes, took samples, and had a series of pilot tests run in the laboratory.

An accurate scale-up correlation quickly established the correct impeller size, speed, and applied horsepower to produce *the exact mixing action the mill's engineers wanted.*

Results: Costly trial-and-error eliminated. No lost time getting the process onstream. Floc stays right size for the filters.

Installation was simple, because all LIGHTNINS are shipped fully assembled, factory-aligned and ready to install. All are built of standard interchangeable components to keep maintenance and parts replacement simple. All parts are easily accessible for servicing.



Gunnar Mines Limited, Uranium City, Saskatchewan, Canada

Get More Out of Your Ore

Have you a tough mixing job to do? Get a LIGHTNIN Mixer to handle it —with results fully predictable, *unconditionally guaranteed.*

For fluid mixing that does what you want it to do, call your LIGHTNIN representative now. You'll find his name in Thomas' Register. Or write us direct.

Lightnin® Mixers

MIXCO fluid mixing specialists

MIXING EQUIPMENT Co., Inc., 234-h Mt. Read Blvd., Rochester 11, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 10, Ont.

Idaho *(Continued)*

equipment taken down to the camp from the mine portal (at 9,000 ft elevation) for overhaul during the winter shutdown have been reinstalled and de-watering of the underground workings is expected to be completed by late June. The program this year will include crosscutting from the 2750 level of the newly-deepened shaft to the areas where diamond drills intersected favorable ore showings last year.

Bunker Hill Co. has stepped up production of by-product sulphuric acid from 300 to 350 tpd at its electrolytic zinc plant at Kellogg by adding liquid sulphur to the roasters. About 15 tons of sulphur obtained from the Jefferson Lake Sulphur company's Manderson, Wyo., plant is being burned daily in the roasters to enrich the gases which are piped to the adjoining acid plant. Demand for the company's acid product has recently been outrunning supply and orders have been turned down. Much of the plant's output now goes to the J. R. Simplot Co. in southern Idaho for the manufacture of fertilizer and to Dawn Mining Co.'s uranium processing plant at Ford, Wash.

Triumph Mining Co. has concluded arrangements with Machinery Center Inc. of Salt Lake City for sale of the plant equipment at its Triumph Mine, the last remaining large lead-zinc operation in the famous old Hailey District of Blaine County.

Salmon River Uranium Development Inc. expected to have the new thorium concentrating plant on its Sunnyside claims on the Salmon River near North Fork in operation by the middle of July. Construction of the mill building was well along, and the machinery and equipment, purchased in Montana, were already on hand and ready for installation. The plant will have an initial capacity of 100 tpd but can be expanded if necessary. The company has blocked out a large amount of thorium ore on the claims and is ready to start mining.

Silver Buckle Mining Co. of Wallace has concluded a one-year custom milling contract with Dawn Mining Co., Newmont subsidiary, agreeing to supply 60 tpd of ore to Dawn's uranium processing plant at Ford, Wash., from the Spokane Indian reservation ore deposit which Silver Buckle recently took over from Northwest Uranium Mines Inc. under a deal involving liquidation of Northwest.

The contract became effective July 1. Stripping of the drilled-out ore deposit on the Indian land lease was started in mid-June in preparation for open-pit mining. Conex Inc., Portland earthmoving firm, has the contract for stripping and mining operations.

Despite the metals price slump last year, gross tonnage mined from Coeur d'Alene district properties during 1957 was greater than in the previous two years and the value of the production was the highest since 1952, according to sworn statements filed by 22 mining companies

Le Roi CRD one-use bits were used to drill shot- and roof-bolt holes for this tunnel. Upper opening shown, is 43½ ft. wide.

Only CRD Bits Meet Glen Canyon Test

"The CRD one-use bit was superior to any of the ten brands we tested," reports superintendent.

Maintain 15 ft. daily pace through solid sandstone.

Pre-job tests revealed that the Le Roi CRD one-use bits offered the best cost-output advantages for the grueling job ahead. That's why they were chosen to drill two spillway tunnels through solid sandstone for the Glen Canyon Dam in Utah.

Here's how they scored. "Drilling in this sandstone," the tunnel superintendent reports, "the CRD bits averaged 48 ft., compared to an average of only 32 ft. for the other nine competing brands."

"Some bits were a little more durable," he adds. "But they cost up to $12 each, compared to the 24 cents we pay for each CRD bit."

Carbide bits were also tried, but proved impractical. The sand encountered on the job was as abrasive as the grinders used to sharpen the bits, causing them to lose their gauge too quickly.

Help Keep Schedule

On the job, the Le Roi bits are living up to expectations. "We use them to drill shot holes under the roughest conditions I've ever seen," the superintendent states.

In addition to the highly abrasive stone, the bits have to cope with mud and bad water seepage. Yet the bits average 4 to 4½ minutes per 18 ft. hole. As a result, "the first of the two long tunnels is being dug at an average rate of 15 ft. per day."

Le Roi H10AL air legs are used with the CRD one-use bits and comprise 95% of the drilling equipment used on the job. "The Le Roi units are doing a good job for us in the tunnel, helping us to keep the project on schedule," the superintendent concludes.

Investigate the advantages of low-cost Le Roi one-use bits for your next drilling job. Ask your Le Roi distributor about them, or write direct to Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wisconsin. AT-723

WABCO

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Newmatic air tools, Tractair,® portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

THE RIGHT SCREEN FOR YOUR JOB!

Are you faced with a really tough problem in sizing . . . scalping . . . washing . . . rescreening . . . dewatering? The *right* Hewitt-Robins screen is your answer!

Vibrex: Here's the most versatile screen of them all! Simple, field adjustable, stroke, speed, angle to match any requirement . . . circle-throw principle with two massive self-aligning bearings . . . rock-bottom economy coupled with long-life ruggedness!

Eliptex: Exclusive elliptical motion for horizontal operation gives high capacity, fast material progression, and sharp sizing.

Gyrex: This positive-stroke, four-bearing, circle-throw screen has an unsurpassed record for stamina.

hi-G: A modified-resonant unit that has the extra kick for hard-to-screen materials at only a fraction of usual power requirements. Both decks are accessible for cloth changes.

All 4 in standard *suspended* and *base mounted* models!

Whatever your specific screening problems, you will find one of these Hewitt-Robins units *best* fitted for the job. For information or service, contact your local H-R representative, or Hewitt-Robins, Stamford, Connecticut.

HR HEWITT-ROBINS

CONVEYOR BELTING AND IDLERS . . . POWER TRANSMISSION DRIVES
INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

H-R Product Manufacturing Plants in Buffalo, N.Y. • Chicago, Ill. • King of Prussia, Pa. • Passaic, N.J. Amsterdam, Holland • Johannesburg, South Africa • London, England • Montreal, Canada • Paris, France

Idaho *(Continued)*

and nine leasing operations with the Shoshone County assessor.

A total of 1,491,584 tons of ore with a gross value of $41,212,994 was produced last year, compared with 1,468,075 tons worth $40,091,777 in 1956.

Costs of production were up even more in proportion, however, and as a result, the assessable net profit valuation of the district's mines—the basis on which they are assessed for county tax purposes—dropped to $5,279,810, approximately 25% below the 1956 figure of $7,108,110. This will mean a sharp decline in the county's total valuation and tax revenues next year.

Three companies—Bunker Hill, American Smelting & Refining, and Sunshine—accounted for approximately 83% of the district's 1957 tonnage and about 86% of the gross value. Bunker Hill was the largest producer by a substantial margin with a total of 734,996 tons from its Bunker Hill and Star Mines. Gross value of the combined output was $21,105,000. Asarco's four producers—the Frisco, Morning, Page and Galena—turned out 291,141 tons for a gross yield of $9,122,500, and Sunshine's production totaled 206,385 tons with a metal content worth $5,338,000, including that mined for and credited to Silver Dollar, Polaris, Silver Syndicate and Sunshine Consolidated under profit-sharing agreements.

Highest assessable net profit valuation was reported for Asarco's Galena mine. It totaled $1,751,500. The Bunker Hill Mine was second with $1,328,800, and the Lucky Friday Mine, one of the district's newer producers, moved ahead of Sunshine into third with $637,570.

Six mining companies and three leasers reported net losses for the 1957 year.

Crews of Anaconda Co. have stepped up operations in Latah County, where the company has been mining clays to be tested for alumina content at a pilot plant at Anaconda, Mont.

A new shift has been started in an area north of Moscow. The shaft is to be sunk to a depth of 130 ft with samples being taken every few feet. The company has some 3,000 acres under option in the Moscow area.

It is a continuation of work begun last year in the area near Deary, Id. In June, the company shipped about 200 carloads of clay from the Deary area.

Anaconda is experimenting with a process for recovering alumina from the north central Idaho clays in an effort to develop a domestic source of raw material for aluminum production. The company operates an aluminum reduction plant at Columbia Falls, Mont.

MICHIGAN

Cleveland-Cliffs Iron Co.'s Mather "A" and "B" shaft mines, the Bunker Hill-Maas and Cliffs underground properties on the Marquette range are operating

Yieldable Arch provides 'safety valve' against squeezing pressures

As its name implies, the Yieldable Arch is designed to give under the squeeze of heavy ground, instead of suddenly letting go. This yielding action gives the overburden a chance to settle slowly into a natural arch around the drift or tunnel.

Each set of Yieldable Arches is made up of rolled U-shaped segments, heavily flanged to resist torsion. Segments nest into one another at the ends to form a sliding joint which is secured by U-bolt clamps. The clamps are drawn up tightly enough to create friction joints which hold fast under normal loads. But when pressures bear down, friction in the joints is overcome and the segments slide, thus acting as a sort of safety valve to keep the steel arch from buckling or deforming under the crushing load.

Yieldable Arches are easy to install; no special tools or fancy equipment is needed. Your own men can set them up and take them down with only a minimum of supervision. And that brings up another important point: Yieldable Arches are usually recoverable for reinstallation elsewhere in the mine. They frequently pay for themselves within the first year of service. One of our engineers will gladly give you full details on the Bethlehem Yieldable Arch.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

The tough ones come to Card

In hard rock mining, haulage equipment takes a real beating. Three-ton boulders drop ten feet and more into mine cars with a force that dents good half-inch steel plate. CARD cars have whipped these tough conditions for many of the major ore producers of the western hemisphere.

Familiar names like these and many others dot the C. S. CARD customer lists over and over with their repeat orders. CARD cars built to order for these firms cost little more than standard stock models, yet they result in large savings because they are built to handle specific mining requirements.

CLIMAX MOLYBDENUM
INTERNATIONAL MINERALS
PHELPS DODGE
KENNECOTT COPPER
U. S. VANADIUM
U. S. POTASH
VERMONT COPPER
HOWE SOUND
CALERA MINING
HOMESTAKE
TELLURIDE MINES
IDARADO
CANANEA CONSOLIDATED COPPER CO.
ANACONDA
VICTOR CHEMICAL WORKS
CLEVELAND CLIFFS IRON
POTASH CO. OF AMERICA
CONSOLIDATED MINING & SMELTING CO. OF CANADA
AMERICAN SMELT. & REF.
UNITED STATES SMELT. REF. & MINING
UNION PACIFIC COAL
GENEVA COAL CO.
COLO. FUEL & IRON CORP.
INDEPENDENT COAL & COKE
COLO. & UTAH COAL
TUNGSTEN MINING
NEW JERSEY ZINC

CARD car engineering can do the same for you. Ask us for consultation on your outstanding haulage problem. No obligation.

C.S. Card Iron Works Co.
2501 WEST 16th AVE.,
DENVER, COLORADO

Michigan *(Continued)*

four days a week, three weeks a month. The Humboldt and Ohio lean ore pits are idle, but the Republic is working five days per week. Republic is owned by Cleveland-Cliffs, Inland Steel, Jones & Laughlin, International Harvester, and Wheeling Steel Corp. It has a capacity of 600,000 tons of pellets per year and the first pellets were shipped in 1956.

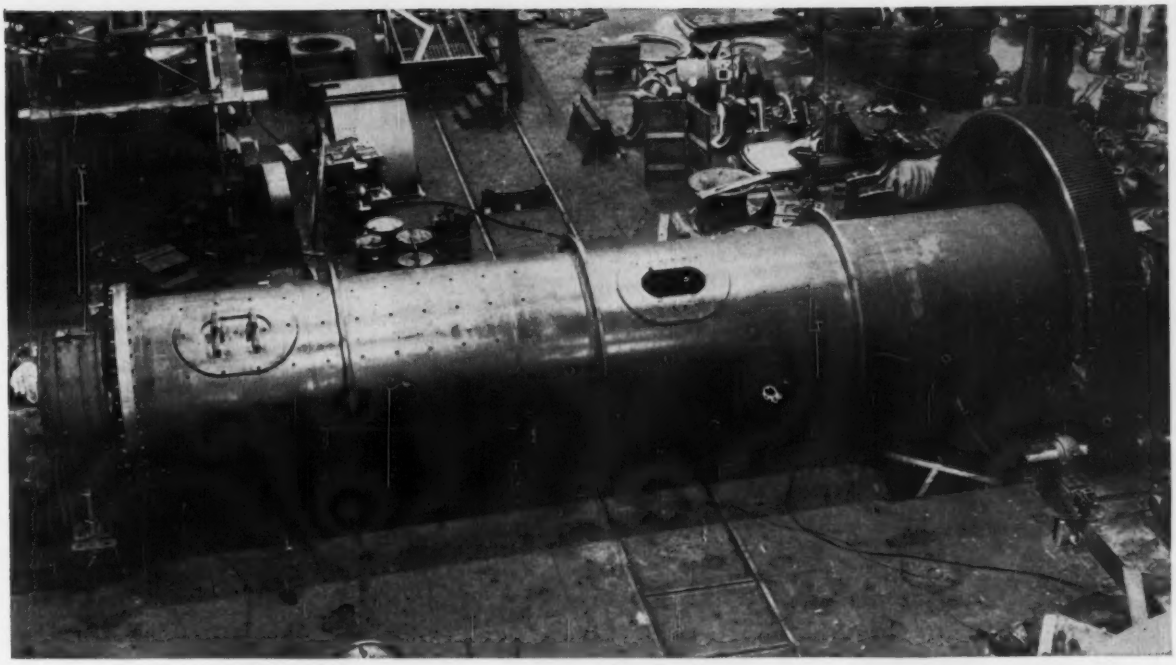
The Cannon mine of M. A. Hanna Co., located near Stambaugh on the Menominee range, has an efficient and modern ventilating system. Outside air is drawn in by fan and blown down through four steel tubes from surface to the mining levels. It can furnish up to 120,000 cubic ft of air a minute. Exhaust air comes up through the main hoisting shaft. The air supply is heated during the winter months to prevent ice from forming in the supply tubes. The Cannon is a consolidation of the Bengal, Tully and Baker mines. First ore was hoisted through a new shaft March 23, 1955. In 1957 the mine shipped 731,903 tons.

In reference to Pickands, Mather & Co.'s Michigan mines, A. D. Chisholm's letter to company employees had this to say: "The Peterson mine (at Bessemer), the Sunday Lake (at Wakefield) and the Cary (at Hurley, Wis.)—all on the Gogebic range—will continue to operate on their present reduced basis. The Newport-Geneva mines (Gogebic range) will probably remain closed for three or four months and, if conditions do not improve, the period of shutdown may be longer. In the Iron River district (Menominee range) present outlook indicates the Buck mine will continue to operate at the present reduced level. In all letters he said that major problems ahead which employees can help solve are: (1) improvement of product. (2) increase efficiency to bring costs down to a competitive level. (3) reduce the tax burden placed on iron ore operations. He added: The present picture could change if there is an upswing in steel production to anything approaching what we have come to consider as normal production. If this occurs, "we will make every effort to increase our employment as rapidly as possible."

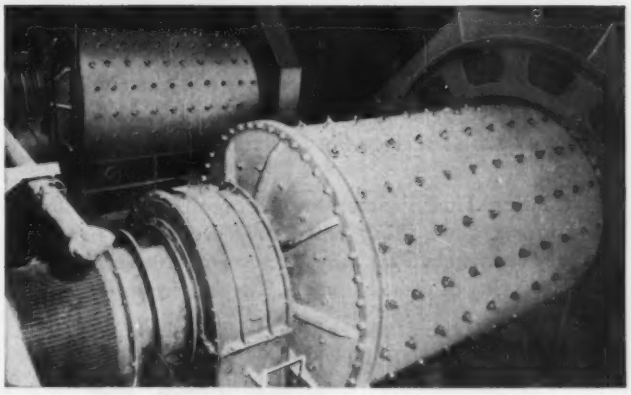
MINNESOTA

Pickands, Mather & Co. is operating the Tioga No. 2, the Mahoning, Scranton, Danube, Embarrass and the Erie Mining Co. taconite plant, all on a reduced basis, on the Mesabi range. The Mahnomen mine at Crosby on the Cuyuna range is operating and employs about 120 men.

The Crow Wing county mine inspector's report for 1957 shows that 26 mines were operated during the year employing 1050 men. A total tonnage of 2,491,973 tons was shipped from the Cuyuna range of which 512,900 tons was direct shipping. 4,465,523 cubic yd



KENNEDY BALL, ROD AND TUBE MILLS



KENNEDY Mills enjoy a reputation for dependable operation in wet or dry grinding at low cost and with minimum maintenance.

Duty—For grinding ores, cement clinker, and other materials. The center peripheral discharge rod mill is used for manufactured sand.

Sizes—Wide range of sizes—to 2500 horsepower per mill.

Design—Large diameter trunnions simplify feed and discharge and replacement of grinding media; a motorized hydraulic lift reduces starting torque; either cut steel single helical gear and pinion or totally enclosed integral gear drives are available. Mills can be arranged for overflow, lifter and center peripheral discharge.

Construction—Cast steel or Meehanite heads; welded and stress-relieved heavy steel plate shells; liners selected for the specific product.

KENNEDY VAN SAUN
MANUFACTURING & ENGINEERING CORPORATION
405 PARK AVENUE, NEW YORK 22, N. Y. • FACTORY: DANVILLE, PA.

Crushing 60,000 lbs. per week
of glass-sharp, extremely abrasive material is the job of these hammermill hammers. No wonder they become rounded and worn, lose cutting efficiency, require regular build-up.

HARDFACING WITH AMSCO 20

doubles service life . . . cuts electrode costs

Welding Flux Processing, Chicago Heights, Illinois, know a good thing when they see one. That's why they've switched *exclusively* to Amsco 20 electrodes for hardfacing of these hammers. They're saving three ways:

1. Service life of the built-up hammers and the mill housing itself has been doubled, because of Amsco 20's high abrasion resistance.
2. Amsco 20 electrodes cost about 40% less than the type previously used.
3. Welding speed is stepped up. Amsco 20, an iron powder "contact" electrode, is easy to handle and gives a high deposition rate.

In this and many other severely abrasive applications, Amsco 20 has *proved* its ability to provide superior wear resistance at low cost. Available from stock in 3/16" diameter, to handle hardfacing jobs of almost any size.

Call your nearby Amsco Welding Distributor now, for a demonstration of Amsco 20. Or write direct for technical data to: Amsco Welding Department, Chicago Heights, Illinois.

AMERICAN Brake Shoe COMPANY

AMSCO®

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS; JOLIETTE, QUEBEC

Minnesota (*Continued*)

Schroeder Mining Co. is operating its small open pit mine near Chatfield, Fillmore County, in southern Minnesota on a one shift, five day week basis. During its first shipping year, 1955, the mine produced 30,252 tons.

Sir James mine of Algoma Ore Properties, Ltd., Ontario, has entered the shipping list this year on a reduced schedule. The sintering plant at Jamestown is about nine miles from the mine.

Oliver Iron Mining Division is operating its Pioneer and Soudan mines on the Vermilion range five days per week. With the Zenith mine of Pickands, Mather & Co. idle, except for stockpile shipments, the Oliver properties are the only active operations on the Vermilion range at this time.

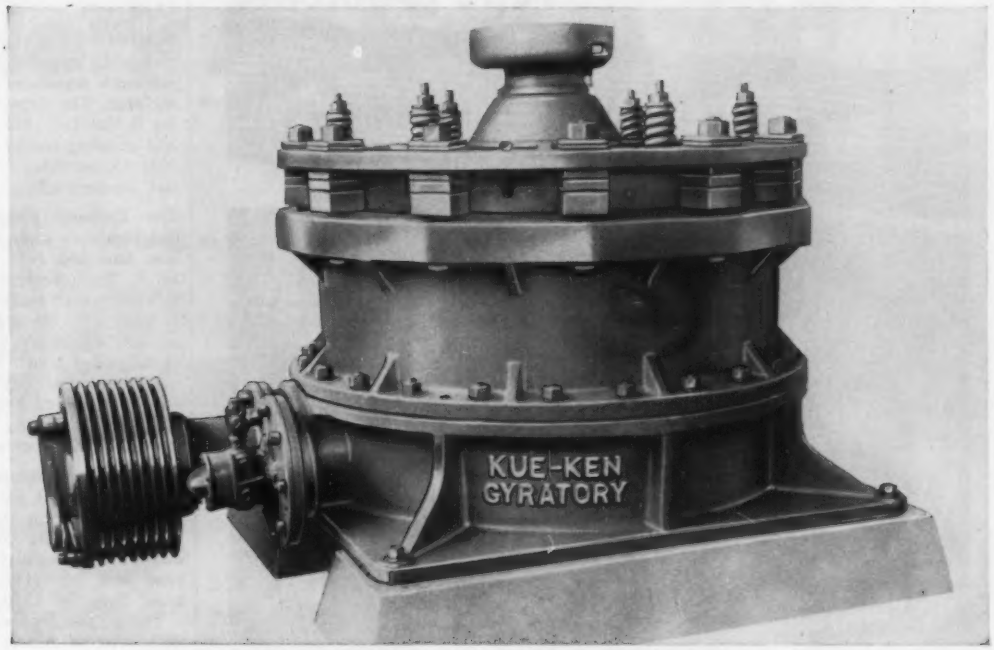
Jones & Laughlin Steel Corp., Minnesota Ore Division, has raised its Hill-Annex mine schedule from 15 to 17 shifts per week. The Columbia at Virginia and the Schley at Gilbert are operating five days per week. Test runs have been made of Schley mine lean ore stockpile at the W. S. Moore Co.'s Mariska plant northeast of the Schley.

Hanna Coal & Ore Corp. iron mines in Fillmore County, southern Minnesota, began operations May 12 and are working one shift, five days a week. The ore is limonitic. A Hardinge scrubber was installed in 1956 to clean clay from the ore.

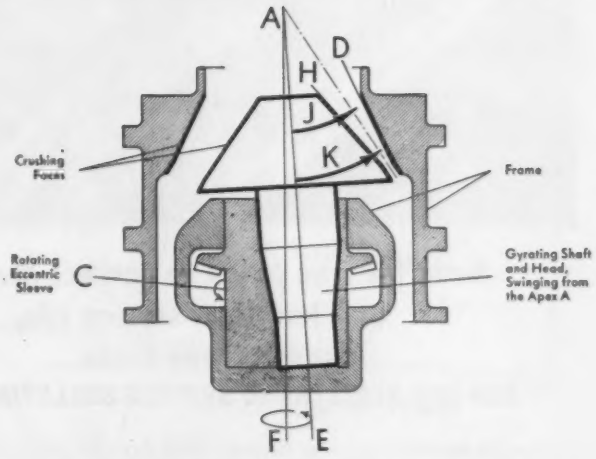
In a letter to all employes from A. D. Chisholm, managing partner of Pickands, Mather & Co., he had this to say concerning the company's Minnesota mines for the 1957 season: The Scranton mine is scheduled to operate on a reduced basis with about 115 men. Mahoning mine will operate in the same manner with some 75 men, but the beneficiation plant is not expected to be used. The Carmi-Carson Lake mine, near Hibbing, is not scheduled at this time to operate this year and it is doubtful whether it will operate in 1959. The Bennett, West Hill and Albany mines will probably not operate in 1958. The Danube mine at Bovey is expected to produce only a modest tonnage requiring about 40 men. The Zenith mine, Vermilion range, will be closed for at least two or three months; and, if business conditions do not improve, a longer shut down may result. It is expected that Erie Mining Co. will continu to operate, but on a schedule consi erably reduced below capacity. The operating open pit mines are scheduled to work on a four day per week basis. Operating underground mines will work four days a week with a one-week shutdown every four weeks with the exception of the Buck mine (Menominee range, Michigan) which is presently operating on a four day week and probably will continue to do so.

A three day celebration was held at Babbitt on June 20-21-22 in honor of Peter Mitchell and other area pioneers who took prominent parts in the the

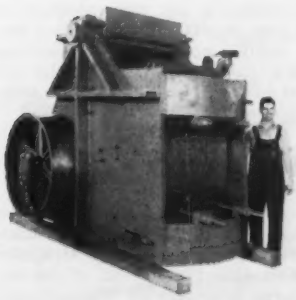
Compact KUE-KEN® for economical gyratory crushing in any operation



Fitting easily where headroom is limited, Kue-Ken gyratory makes profitable secondary crushing practical in any flowsheet. Compact, strong, without excess weight, choke-fed Kue-Ken is adaptable to either a permanent or portable installation. Designed on the exclusive Kue-Ken "crushing-without-rubbing" principle that practically eliminates the main cause of liner wear, Kue-Ken liners give far longer service under continuing, hard materials crushing. For lowest cost-per-ton crushing, design your operation around Kue-Ken jaw and gyratory crushers.



Kue-Ken crushes without the upward abrasive action that quickly wears out liners in ordinary crushers. See how crushing faces pass through crushing zone on arcs J and K to crush rock squarely. Only Kue-Ken operates on this principle of "crushing without rubbing".



WRITE FOR CATALOG

KUE-KEN® CRUSHERS

STRAUB MFG. CO., INC., 8384 BALDWIN • OAKLAND, CAL.

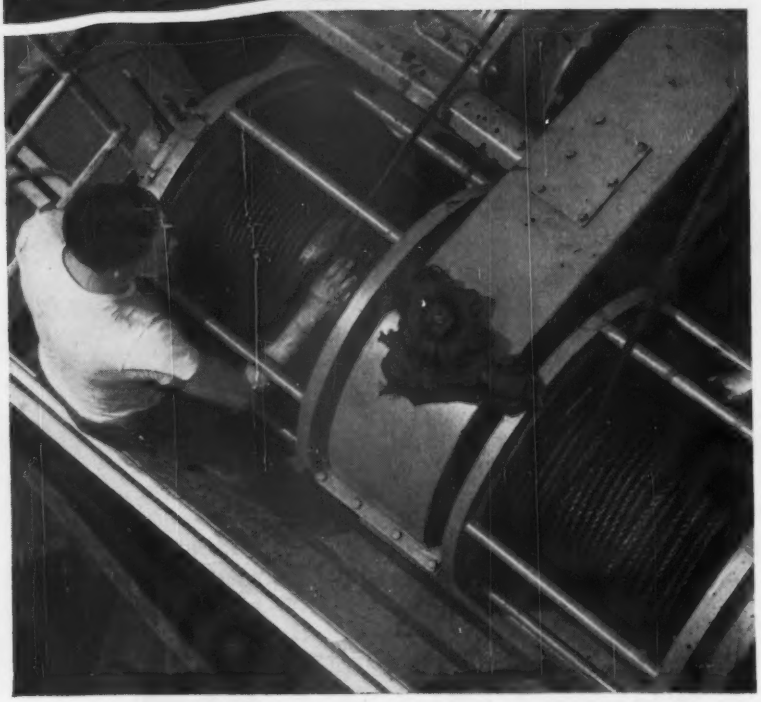
"CRUSHING WITHOUT RUBBING"

Jaw Crushers Gyratory Crushers Overhead Eccentric Crushers Revolving Screens Classifiers Feeders Rib Cone Ball Mills Concentrating Tables Vibrating Screens

Pennsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.
Armstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor, Close Works, Gateshead-upon-Tyne 8, England

lubrication...

is this your wire rope problem?



Send for free guide to correct methods that lengthen service life, cut wire rope costs...

ASK FOR RED-STRAND SERVICE BULLETIN NO. 103

To understand the urgent need for correct lubrication of wire rope, think of it as a machine with many moving parts. All its wires and strands are constantly stretching, twisting and rubbing against each other while the rope as a whole is rubbing against sheaves, drums and the like. This creates friction from end to end and wear will be excessive unless the rope is kept in condition with the right kind of lubricant correctly applied. The whole subject is very clearly explained in Service Bulletin No. 103 which is yours for the asking. Write today to H. K. Porter Company, Inc., Leschen Wire Rope Division, St. Louis 12, Missouri.

LESCHEN
Red-Strand
WIRE ROPE

H. K. PORTER COMPANY, INC.
LESCHEN WIRE ROPE DIVISION

Minnesota *(Continued)*

of stripping was moved during the year. development of the eastern Mesabi range and the taconite industry. Senator Hubert H. Humphrey was one of the speakers. A monument was dedicated on June 22.

Reserve Mining Co.'s crushing and concentrating department has passed its 1 millionth man-hour without a lost time accident. The department began operating in October 1955. It includes crushing and grinding taconite and separating the iron ore particles from the waste material magnetically.

The Edmund Fitzgerald, largest bulk freighter ever built on the Great Lakes, was launched June 7 at River Rouge, Mich. The $8-million ship is scheduled to be delivered on August 15. She is 729 ft long x 75 ft wide and will have a capacity of 26,000 tons and a speed of 16 knots per hour. Owned by the Northwestern Mutual Life Insurance Co., she will be chartered by Oglebay, Norton & Co. of Cleveland for service in its Columbia Transportation Division.

Oliver Iron Mining Division paid its first half (1957) St. Louis county real estate tax with a check for more than $7.4-million. The company's total real estate and personal property tax for the year will be $16,253,000—$2,559,000 more than for 1956.

The largest iron ore occupation taxes in Minnesota history were assessed for 1957: $33,389,059—Oliver's share of this was $23,638,885. In addition, three mining companies—of which Oliver was one —were assessed $397,301 on taconite operations. Reserve took $323,880 of this; Oliver $45,240 and Erie Mining Co. $28,181.

The iron ore movement down the Great Lakes this season is the slowest since 1939. Little more than one half of the U. S. registry ore vessels is in service with no present indication of any important increase.

MONTANA

Employees at Anaconda's Montana Aluminum plant reach another safety goal June 19 by completing one year of work without a lost-time injury.

In March of this year the plant personnel achieved the goal of 1-million hours without a lost time accident. A month later the 600 employees set a new U. S. safety record for the aluminum reduction industry by topping the old mark of 1,082,000 hours on the job without a lost-time injury.

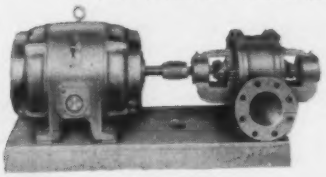
NEW MEXICO

Phillips Petroleum Co. on June 27 began operation of its 1,725 ton per day uranium ore processing mill in McKinley County, making Phillips one of the nation's large producers of uranium concentrate, according to K. S. Adams, chairman, and Paul Endacott, president of the company.

BUILT-IN ASSURANCE

To Help Make Your Plans Work As Specified...

F-M WESTCO PERIPHERAL PUMPS



boiler feed
condensate return
hot and cold liquids
chemicals
refrigerants, etc.

Up to 200 gpm., pressures to 900 ft. High pressure at normal operating speeds. Handle widely varying heads with little change in capacity. Sizes 1¼" through 2½".

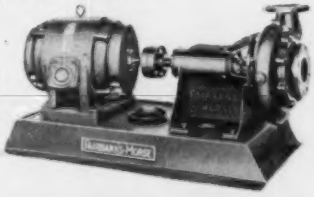
F-M BUILTOGETHER CENTRIFUGAL PUMPS

hot and cold liquids
liquid circulation
low-viscosity liquids
boiler feed
cooling towers, etc.

Up to 900 gpm., pressures to 525 ft. Close-coupled pump and motor units mount horizontal, vertical or angular. Sizes ¾" through 5".

F-M NON-CLOG PUMPS

plant waste
slurries
paper stock
fruit
fish
vegetables, etc.



Up to 30,000 gpm., pressures to 175 ft. Sizes 2" through 20". Vertical or horizontal. Bladeless or conventional.

The best-laid plans can go astray when mechanical equipment fails to deliver according to expectations or fails to give sustained peak performance. That's why Fairbanks-Morse builds something extra into all pumps so your plans work *as specified*.

F-M Pumps You Can Rely Upon

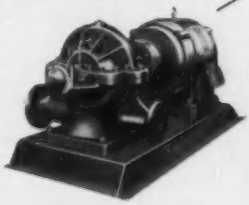
Full-rated capacity guaranteed... with built-in safety margin to assure maximum efficiency under most severe use. Rugged, durable, precision-made to maintain efficiency with minimum service.

Expert Help When You Want It

F-M Engineers are ready to work with you on any of your pump problems.

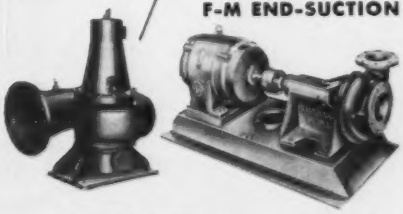
F-M SPLIT-CASE CENTRIFUGAL PUMPS

water supply; plant service
booster; circulating
air conditioning
refrigeration
chemical liquids
boiler feeds, etc.



Up to 50,000 gpm., pressures to 700 ft. Sizes 1½" through 36". Single stage or multistage.

F-M END-SUCTION PUMPS



hot and cold liquids
chemicals
circulating liquids
low-viscosity liquids
cooling towers
condenser circulation, etc.

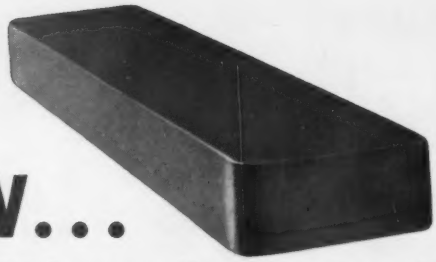
Up to 100,000 gpm., pressures to 250 ft. Sizes ¾" through 54". Horizontal or vertical.

For full information about Fairbanks-Morse pumps, call your F-M Sales Engineer or write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY RAIL CARS • HOME WATER SERVICE EQUIPMENT • MAGNETOS



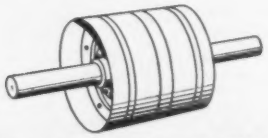
This is

INDOX V...

and STEARNS knows how to use it!

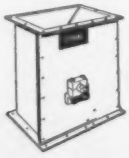
Amazing new ceramic permanent magnet material inspires revolutionary developments in tramp-iron protection.

First to take advantage of the remarkable magnetic properties of Indox V is Stearns — the leader in design and development of magnetic equipment for more than 40 years. *Only Stearns uses Indox V* in magnetic tramp-iron separation equipment. Here are four brand-new Stearns separators that are introducing a new era of tramp-iron protection for all industry.



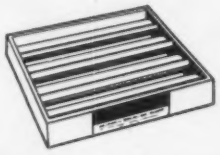
NEW INDOX V MAGNETIC PULLEY

Installed at head of belt conveyor system, outperforms conventional permanent magnet pulleys, equals deep-field power of electromagnetic types. Radial design boosts holding efficiency for maximum separation. Standard widths and diameters to match your present system. Ask for Bulletin No. 1021-D.



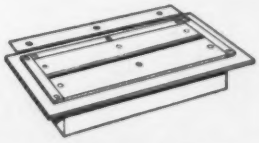
NEW INDOX V MAGNETIC DRUM

An ideal unit for process industries where granular materials are conveyed in enclosed chutes or spouts. Revolving stainless steel cylinder inside a welded steel housing carries material over stationary magnet assembly, which holds iron particles beyond discharge of non-magnetic product. Indox V produces exceptionally uniform field *30 to 40 percent stronger* than old-style permanent magnet drums. Complete range of types and sizes for any installation. Write for Bulletin No. 1051-D.



NEW INDOX GRATE MAGNET

Easily installed in any hopper or floor opening, chute or duct, guards your product and plant against dangerous tramp iron. Collecting tubes, with continuous magnetic poles along their entire length, leave no "dead" spots. Effective area is actually 400 percent greater than in ordinary grate magnets! Complete range of types and sizes for any installation. Bulletin No. 1072-D.



NEW INDOX V PLATE MAGNET

Provides separating efficiency far superior to ordinary plate magnets. Powerful, uniform magnetic field traps iron particles in flowing material in chutes, ducts, spouts or on conveyors. Excellent tramp-iron protection at low cost. Write for Bulletin No. 1073-D.

WHAT IS INDOX V?

Indox V is a highly oriented barium ferrite *ceramic* material. Its energy is comparable, on an equivalent weight basis, to that of Alnico V — the most powerful permanent magnet material available. Indox V magnets possess unique advantages — light weight, high electrical resistivity, great resistance to demagnetization, inexpensive, non-critical raw materials—plus an energy product over three times that of non-oriented ceramic magnets. Indox V is used in separators manufactured by Stearns exclusively.

STEARNS MAGNETIC PRODUCTS

A DIVISION OF THE INDIANA STEEL PRODUCTS COMPANY

635 SOUTH 28TH STREET • MILWAUKEE 46, WISCONSIN

New Mexico *(Continued)*

The mill is 25 miles north of Grants in the Ambrosia Lake area where Phillips in 1956 made its discovery on a wholly owned 1,280-acre mining lease. Drilling has already outlined more than 5-million tons of uranium ore in several closely associated orebodies, says the company, and exploration is continuing. Phillips has completed a shaft and is mining ore on its Ann Lee Mine and shafts are being sunk for its Sandstone and Cliffside Mines in the area.

NEVADA

Nevada-Massachusetts Co. closed its big tungsten mine in Pershing county on June 30, putting 71 men out of work and leaving only a skeleton crew of nine to take care of the property. Nevada-Massachusetts had been operating the mine since the World War I and was one of the nation's largest tungsten producers. During early 1957 it employed 275 men, but that number was reduced when Government price supports ended. From then until June 30 the crew of 80 had been operating the Sutton No. 2 shaft and the Humboldt shaft, which is 1,850 ft deep. The mill was kept operating 24 hours daily and was handling 300 tpd. The employees lived in Government-built houses at Tungsten on the mine site, but the community was practically deserted following the shut-down. Decision to close operations was made at a June meeting between Charles Segerstrom Jr., of Sonora, Calif., company president, Eldridge Nash, superintendent of operations, and Dan O'Keefe mine foreman, along with union officials.

Cordero Mine, Nevada's largest mercury producer, is currently employing 200 men (one of the largest crews in firm's history) at its property in northern Humboldt County. Ore deposits good for a long time to come are reported by Cordero officials, and production is continuing steadily at a high rate.

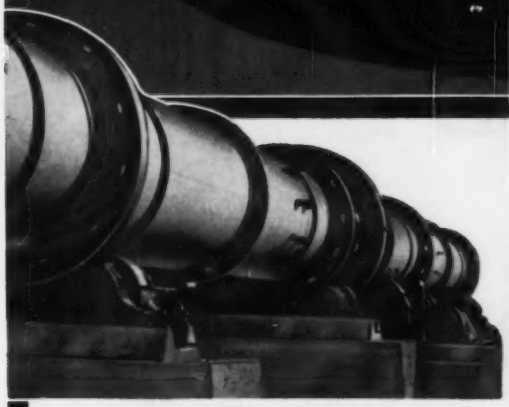
Combined Metals Reduction Co. is operating its Caselton mine near Panaca in Lincoln County and is producing perlite at the rate of 100 cars per month. Since April three shifts have kept operations in progress around the clock. The material is upgraded at the plant site and shipped to market points by rail where it is sold under the name of Panacalite.

Edgemont Mining Co. has awarded Boyles Brothers Drilling Co. a contract for 2,000 ft of underground diamond drilling in northwest Elko County. The drilling will be done from a drift driven on the Lucky Girl vein to explore the Lucky Boy vein which is parallel to the Lucky Girl. The properties produce gold-silver ore. A drift on the Lucky Girl vein has been driven to a point 1,300 ft from its intersection with the Burrell adit.

Apex Minerals Corp. during June announced a new strike at its mine near Austin which is said to be the most important found up to that time. The strike exposed ore ranging from 0.2 uranium

Traylor -MADE

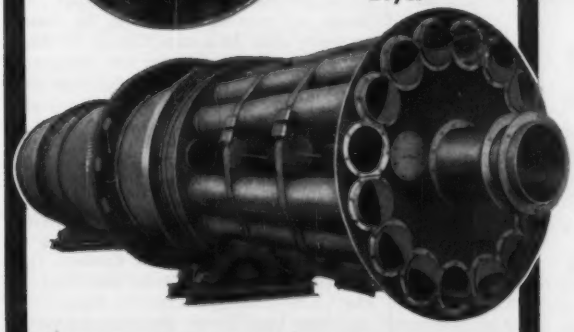
KILNS · COOLERS · DRYERS



Traylor Rotary Kiln

Traylor Rotary Cooler

Traylor Rotary Dryer



Hundreds of Traylor Rotary Kiln installations are in daily use in thermo processing operations throughout the world. The vast kiln designing experience of Traylor Engineers is reflected in the many advanced features found in Traylor Kilns. The shells are made of quality steel plate, automatically welded together, with the necessary bars at points of maximum stress. Full floating type riding rings, attached to the shells without bolts or rivets, are turned true and smoothly faced. Both the main gear and pinion are reversible for extra wear. These and many other features are available in a Traylor-made Kiln.

Traylor Coolers are made in 3 types: Conventional design—a straight flow unit, Diaphragm design—a cooler fitted with diaphragms to keep material well showered and propelled forward, Multiple Tube design—made in air cooled or water and air cooled type, keeps material from direct contact with the cooling air. Special coolers can be provided for special conditions.

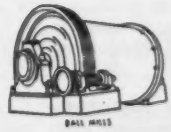
Traylor Rotary Dryers employ the same construction features as Traylor Kilns and Coolers. Traylor builds Rotary Dryers of 2 types: Indirect Fired Dryers in 3 designs and Direct Fired Dryers in 2 designs. For more information on Traylor Kilns, Coolers or Dryers, write for Traylor Bulletin #1115.

TRAYLOR ENGINEERING & MFG. CO., 1081 MILL ST., ALLENTOWN, PA.

Sales Offices: New York — Chicago — San Francisco

Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P.Q.

Traylor

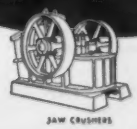


BALL MILLS

ROTARY KILNS

APRON FEEDERS

PRIMARY GYRATORY CRUSHERS



JAW CRUSHERS

SECONDARY GYRATORY CRUSHERS

E. A. GODOY & CO., INC.

CUNARD BUILDING, 25 BROADWAY

NEW YORK 4, N. Y.

GENERAL AGENTS

FOR

MINING COMPANIES

T-H YIELDING ARCHES

Cut Costs the Tried and Proven Way

- √ Toussaint-Heintzmann — the original yielding steel arch.
- √ Tested and proven through 30 years of development and research in thousands of installations.
- √ Made of heat-treated steel and available in seven different section weights (8.6 lbs/ft to 29.5 lbs/ft) for maximum economy.
- √ Automatically yielding connections requiring a minimum of attention.
- √ Recoverable and can be repeatedly reconditioned without heat process.
- √ Thorough engineering service is provided.
- √ Maintenance costs cut to a minimum in areas of difficult ground support.

BOCHUMER EISENHUTTE HEINTZMANN & CO.

ROCKIRON

—THE ROCKIRON COMPANY, LIMITED—

Sudbury, Ontario

EASTERN U.S.A. REPRESENTATIVE

The Burridge-Nyland Equipment Company — ISHPEMING, MICHIGAN

Nevada (*Continued*)

oxide up to chunks of high grade specimens running in excess of 10%. AEC engineers who inspected the site recently are quoted by company officials as saying the property definitely has pitchblend, which puts it in a group with the top quality uranium mines.

White Caps Mining Co., headed by George Rong, has announced plans to erect a 75-ton mill at its property near Manhattan, north of Tonopah. The company has also acquired 32 additional claims in the White Caps area. Steady production of antimony and other ores has been continuing for the last months at the Manhattan property under Rong's supervision, and the new plans are part of a current expansion program.

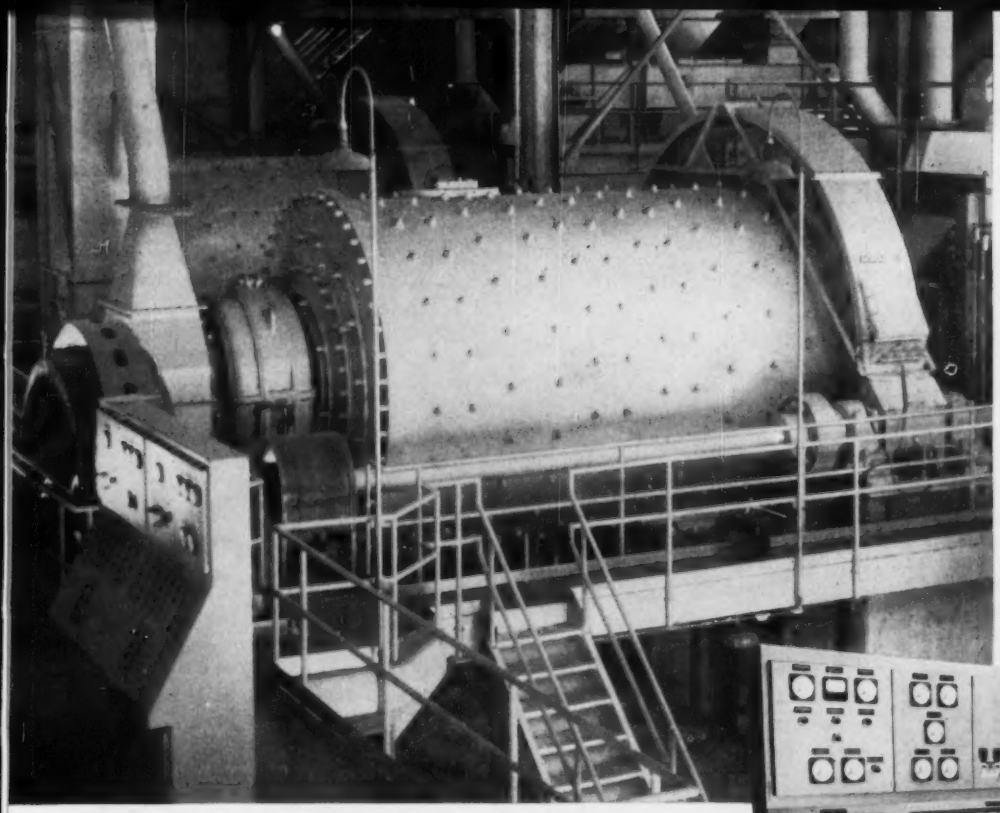
Combined Metals Corp. is employing 30 men at the Bristol Mine in Lincoln County, where high grade copper ore is being produced at the rate of seven cars weekly. Ore shipments have been going by rail to a smelter in Utah, but company officials during June were seeking a new marketing point since the Utah smelter was scheduled to quit handling custom ore during July.

Much of the equipment from the big gold-silver mill at Seven Troughs, 30 miles northwest of Lovelock, was moved to the Argenta mill near Coaldale during June. The transfer job was handled by Curtis Cline, Tonopah house mover, who was assisted by Robert West. The Argenta Co. will use the equipment to process tailings from the old mining town of Candelaria north of the present mill site, and material is blocked out which assures several years of operation. The Seven Troughs mill, one of the best of its kind, was erected a number of years ago to handle ore from nearby mines which did not come up to expectations. It has remained idle for a long time.

Standard Slag Co. has shipped six carloads of uranium ore from its leased property near Mountain City in northern Elko County. Five men are employed on the site carrying out exploration and development work on a large acreage of claims. Uranium content of the ore is reported to be satisfactory. The leased area consists of 72 lode mining claims held under lease and option.

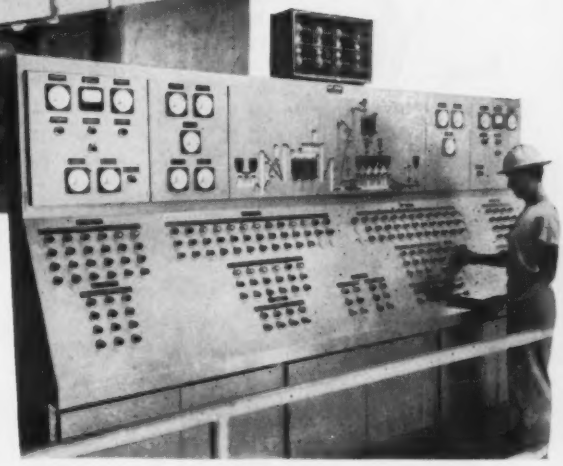
U. S. Mining & Minerals Corp. during June reopened the Ohio Gold Mine at Gold Point in Esmeralda County. Ore from the property will be processed at the U. S. Mining & Minerals Corp. mill at Silver Peak about 20 miles northeast of Gold Point, which is currently processing gold and silver ore from the Black Mammoth mine. A. W. Rischmiller, vice president of the corporation, is engineer in charge of the Gold Point operations, and orebodies already blocked out assure continued operations. The Ohio mine was a good producer prior to World War II when it was closed by Government order. Ore shipments began in early July.

Construction of the Eagle-Picher Co.'s $2.25-million diatomaceous earth proc-



Left: Two of five 11′ x 17′ Nordberg Grinding Mills installed for dry process service at a new cement plant.

Below: Close-up view showing modern, functional Nordberg grinding mill control console, with interlocking relays for sequence starting of all equipment. Note flow diagram with indicator lights at center of top panel.



3 reasons why it pays to specify NORDBERG GRINDING MILLS

1 Advanced Engineering Nordberg mill design reflects significant technological improvements that may measurably affect your installation and operating costs. Sealed trunnion bearings; positive bearing lubrication; optimum life of wearing parts are among the features that will benefit you.

2 Quality Manufacture Nordberg Mills are (1) precision built to rigid specifications in shops renowned for (2) skilled manufacturing personnel, and (3) modern machine tools and equipment to assure quality workmanship. Good reason why the name NORDBERG has always signified the *ultimate* in mining, quarrying and process machinery.

3 Dependable Operation A team of experienced application engineers with a sound understanding of your milling operations qualifies Nordberg to serve you. More important, it assures you of the right machinery for the job . . . machinery that must be dependable and will continually produce to your specifications.

Nordberg Grinding Mills are built to meet specified conditions for wet or dry grinding—in the manufacture of cement; the fine reduction of metallic and non-metallic minerals; and in numerous other processes where friable material must be comminuted to fine sizes at low cost per ton. They are available with grate, overflow or peripheral discharge . . . and are built in sizes from 6 feet to 13 feet in diameter and up to 50 feet in length.

Write for a copy of Bulletin 232, which describes the complete line of Nordberg Grinding Mills.

©1958, N. M. Co.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

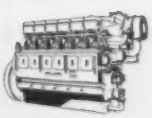
NORDBERG

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY
MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS • SAN FRANCISCO
TAMPA • WASHINGTON • TORONTO • VANCOUVER • GENEVA
JOHANNESBURG • LONDON • MEXICO, D.F.

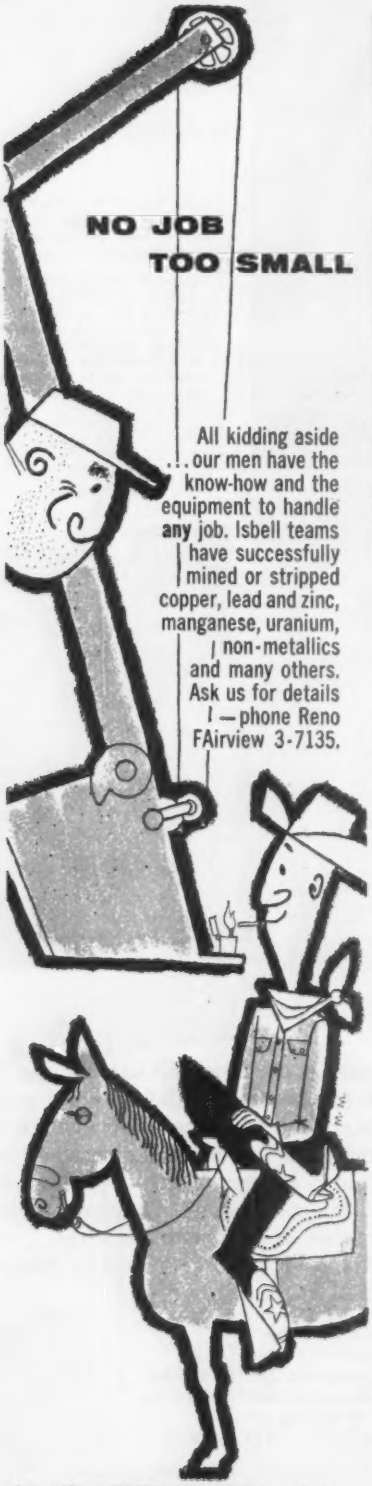
SYMONS® CONE CRUSHERS

SYMONS VIBRATING GRIZZLIES and SCREENS

ROTARY KILNS and COOLERS



NORDBERG ENGINES to over 11,000 H.P.


NO JOB
TOO SMALL
All kidding aside ... our men have the know-how and the equipment to handle any job. Isbell teams have successfully mined or stripped copper, lead and zinc, manganese, uranium, non-metallics and many others. Ask us for details — phone Reno FAirview 3-7135.

ISBELL
CONSTRUCTION COMPANY
P. O. Box 2351 • Reno, Nevada
Telephone FAirview 3-7135

 (*Continues on p 193*)

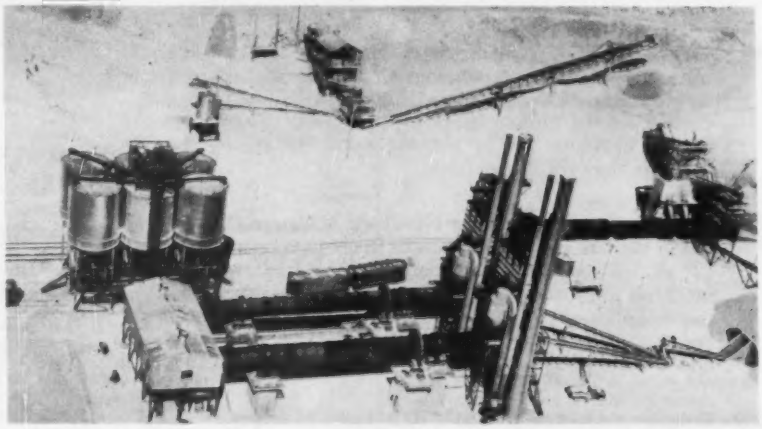
IRON ORE PELLETS for U. S. and Canadian steel mills is now being shipped.

Inco's Copper Cliff Reaches Capacity

THE FIRST of three units for iron ore recovery at International Nickel Co. of Canada's Copper Cliff, Ontario plant has attained capacity operation of 250,000 tons per year. Two more units will be constructed.

The plant employs an Inco process that treats a nickel-bearing iron sulphide to yield pellets containing 68% iron, 0.15% silica and 0.01% sulphur. The product is shipped to the steel industries of the U.S. and Canada as open hearth charge ore.

Installations in the photo are: left, the roaster kiln building, leaching section, recovery building and the pellet plant. Inco's stack, 637 ft high, is claimed to be the tallest smelter chimney in the world. The recovery plant was constructed at a cost of $20-million.



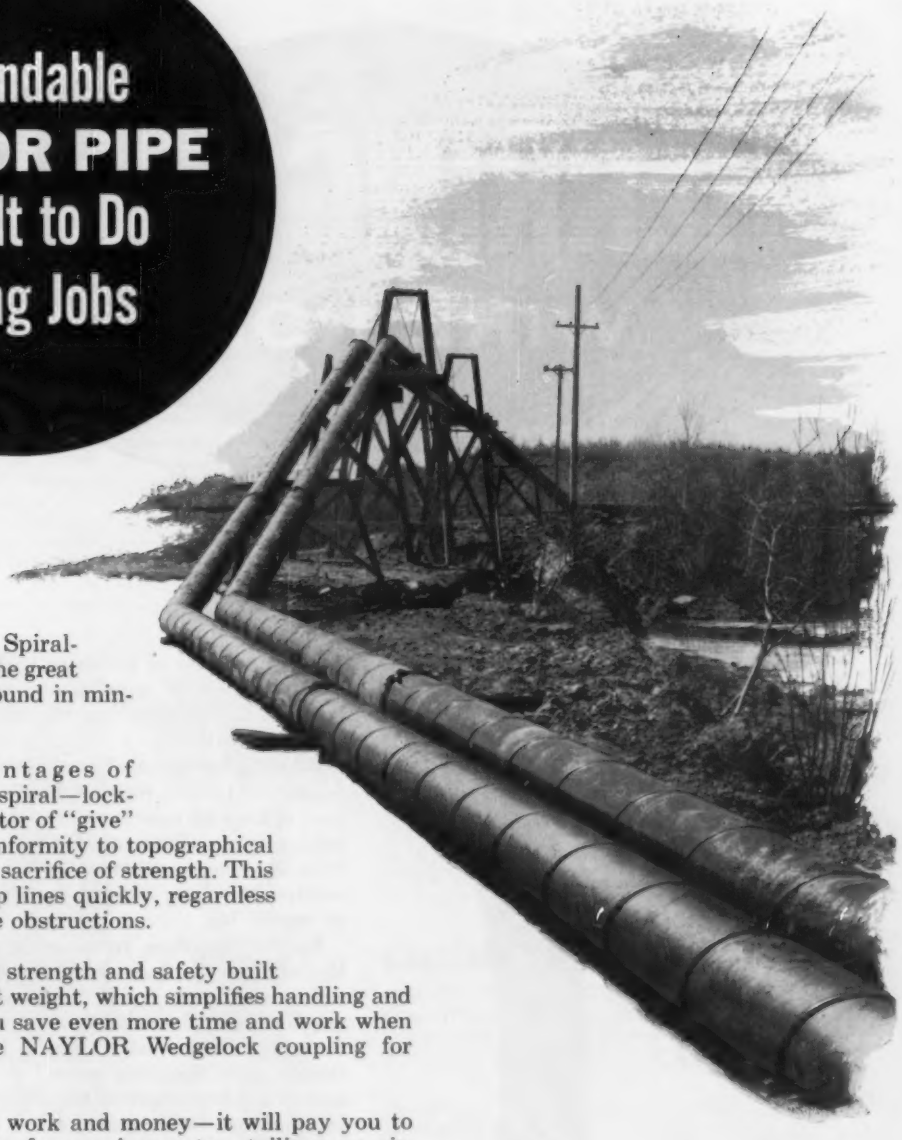
PLANNING for future as well as present demand was a guide for U. S. Lime Products.

U.S. Lime Products Opens $2-Million Plant

DAILY PRODUCTION of 400 tons of quicklime is coming from the new U.S. Lime Products Corp. facility at Arrolime, Nev., some 19 miles northeast of Las Vegas. Raw limestone is mined by open pit near the plant site and from Nelson, Ariz. and Sonora and Columbia, Calif. Rock is crushed before stockpiling near the plant. It is moved by conveyors through a reclaiming tunnel to bucket elevators, passed over a single deck screen to eliminate fines and dropped into bins in front of preheaters.

A plunger-type reciprocating feeder drops the preheated stone into two rotary kilns (150x10-ft, fired by natural gas). Contact cooling follows, with variable speed screw type feeders which discharge onto apron conveyor to bucket elevator to double deck 3x8-in. screens. Screen product is distributed to one of six 500-ton silos for eventual shipment.

Dependable NAYLOR PIPE is Built to Do Mining Jobs



You'll find NAYLOR Spiral-weld pipe adaptable to the great variety of conditions found in mining operations.

One of the advantages of NAYLOR's exclusive spiral—lock-seam structure is its factor of "give" which assures closer conformity to topographical conditions without any sacrifice of strength. This enables you to make up lines quickly, regardless of terrain or man-made obstructions.

Along with the extra strength and safety built into this pipe is its light weight, which simplifies handling and speeds installation. You save even more time and work when you use the one-piece NAYLOR Wedgelock coupling for connections.

For savings in time, work and money—it will pay you to specify NAYLOR pipe for moving water, tailings or air.

To get details, write for Bulletin No. 507

NAYLOR PIPE *Company*

1243 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

New **Longer-Wearing** Pattern in Wire Rope Styles!

After three years of extensive field trials this, the newest of Roebling's wire ropes, is now ready to go to work for you on a service basis that will exceed that of *the wire rope you are now using.*

Roebling Herringbone* combines the best features of both regular and Lang lay rope constructions; being made up of two *pairs* of Lang lay strands and two strands of regular lay. The regular lay strands separate the two pairs of Lang lay strands. Thus, in one rope you have the superior flexibility and abrasion resistance of Lang lay and the greater structural stability of regular lay.

For the past three years, under all kinds of conditions, Herringbone has been used for general hoisting, holding and closing lines, shovel ropes, wagon scraper ropes and dragline ropes. The results have been wonderful . . . excellent flexibility, exceptional resistance to shock and abrasion, smooth, easy operation around drums and over sheaves, smooth spooling properties and structural stability unequalled by other rope for the same job.

There has never been a better time—or a wider need—for a wire rope that returns so much service for its cost. And, in addition to being a top performer on the job, Herringbone eliminates the necessity of stocking Lang lay for one purpose and regular lay for another.

You are invited to get in touch with your Roebling distributor or write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for further and fuller details on the *investment* qualities of this new and highly serviceable rope.

*Reg. appl. for

ROEBLING

Branch Offices in Principal Cities • Subsidiary of The Colorado Fuel and Iron Corporation

Nevada (*Continued*)

essing plant at Colado was more than half completed during June, according to officials of Kaiser Engineers who are in charge of the construction. The metal warehouse is up and concrete work has been completed, as well as equipment for receiving and handling soda ash on the railroad spur. The concrete office building of nine rooms has been finished, and most of the processing equipment is in place. During the third week of June a group of executives from Eagle Picher's Celatom Products Department toured the Colado construction, the Trinity Mountain mine site west of Lovelock and the Eagle Picher diatomaceous earth processing plant at Clark's Station 20 miles east of Sparks.

Like the forty-niners, Jerrell S. Wisdom is finding gold riches in White Pine County with a mechanical gold pan.

But unlike the early-day miners, Wisdom isn't bound to the stream beds or lake shores.

He has a mobile plant that enables him to roam far and wide from his home base at Goldpoint. Major units in his flexible operation are a pickup truck, a Denver Equipment Co. mechanical gold pan, portable water pump, self-made hopper, a long tom (12-ft long wooden trough for carrying away tailings).

Wisdom said his portable plant is highly profitable and the future is even brighter.

"There are 400 camps I know of in Nevada alone," he said, "where the old timers left the placer."

Wisdom has found fruitful hunting among dumps at old mills in Nevada. As he tells it:

"Take Goldfield. I got an average of $17.77 (per ton) off the surface. I load the oxides into my truck, haul three miles to my water and mill site, then wash. The stained gold is made amenable to mercury by treating with acid. After restoring the amalgam, I get fine gold, which I ship to smelter.

"Values from the first takeoff range from $10,000 per ton on down to $1,250."

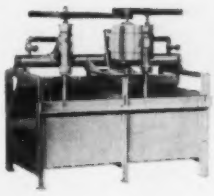
Wisdom made some changes in the Denver Equipment pan. "Not only did I make a few simple improvements so as to change over without a wrench (he

See something modern, something new for

Mine, Mill & Laboratory

(Galigher Booth 1600)

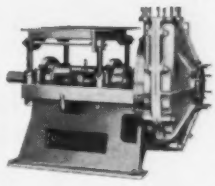
1958 Mining Show at San Francisco Sept. 22-25



AGITAIR®

Flotation Machine renowned throughout the world for high recovery performance . . . low cost operation.

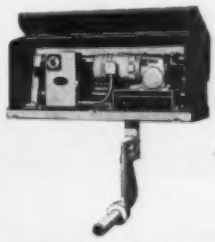
Operation models of each of these products will be displayed.



VACSEAL PUMPS

. . . a complete line of solids handling and acid pumps. Sizes 1½" to 8".

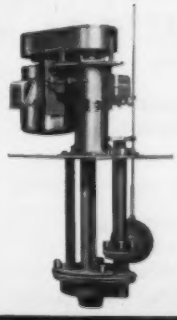
Samples exhibited of construction-materials and parts for all replaceable liner VACSEAL Pumps.



GEARY-JENNINGS SAMPLER

. . . accurate, automatic samples of practically all kinds of material.

Metallurgical engineers will be in attendance to explain Galigher products and services.



GALIGHER SUMP PUMP

available in acid-proof or standard construction. No seals, packing or submerged bearings. Sizes 1½" to 2½" — capacities 10 to 250 GPM.

See the new all plastic sump pump in operation.

AP-504

GALIGHER

CONSULTATION • ORE TESTING • PLANT DESIGN

Leaders in Experience and Service

GALIGHER PRODUCTS: AGITAIR® Flotation Machine, VACSEAL Pump, Geary-Jennings Sampler, Acid-proof Sump Pump, Geary Reagent Feeder, Laboratory AGITAIR® Flotation Machine, Laboratory Pressure Filter, Laboratory Ball Mill, Rubber Lined and Covered Products, Plastic Fabrication.

METALLURGICAL DIVISION . . . ENGINEERING SERVICE

The GALIGHER Co.

HOME OFFICE: 545-585 W. 8th South, P. O. Box 209, Salt Lake City 10, Utah
EASTERN OFFICE: 921 Bergen Ave. (Room 1128), Jersey City 6, New Jersey

Nevada (*Continued*)

used wing nuts), but I also put a larger ring between the pans (traps) to make it simple to put together without each pan overlapping."

He suggested that prospectors include a hopper on the pan. He explains that "with a hopper and with skids bolted on, the pan is more versatile."

NORTH CAROLINA

E. R. Wellmon, mica miner, has reported discovery of columbite ore in Cleveland County, near Shelby, but has expressed doubt that a "mother lode" will be found as the ore so far recovered may be from a small, isolated deposit.

William R. Ferrell Jr., of Rock Hill, and J. W. Ashley of Lancaster, S. C., who have been prospecting in the area for several years, report the discovery of gold ore in Mecklenburg County, where it was mined a number of years ago. They are seeking funds to continue.

They said the biggest nugget found was about the size of a marble and 90% pure. The exact location was not divulged, but they said they also ran into deposits of tungsten, copper and barium.

Piedmont Minerals Inc., of Greensboro, has leased mineral rights to all kyanite found in the Hager's Mountain area near Roxboro, and if tests prove satisfactory, plans to locate a processing plant there.

PENNSYLVANIA

Foote Mineral Co., Philadelphia, has become the exclusive United States and Canadian sales agent for Sherritt Gordon Mines Ltd., Toronto, and will handle the nickel and cobalt from the company's facilities at Lynn Lake, Manitoba and Fort Saskatchewan, Alberta.

Sheritt Gordon's 1957 output included 20,067,367 lb of nickel and 172,053 lb of cobalt.

TENNESSEE

Full production of flake mica from the largest known source of raw material in the country was started in July by International Minerals and Chemical Corp.

With completion of an expansion program to provide additional grinding capacity, the company's plant on Davy Crockett Lake near Greenville, Tennessee, has jumped production potential from a pilot plant stage of 24 tons to full capacity of 120 tpd, according to Norman J. Dunbeck, IMC vice-president in charge of the Industrial Minerals Division.

The plant draws from a source of supply unlike any other in the mica-producing industry, a deposit of mica-bearing silt that has been accumulating for over 50 years in a five-mile delta in Davy Crockett Lake about six miles upstream from the Tennessee Valley Authority's Nolichucky Dam. It has been estimated that the mineral-bearing deposit, over 40 ft thick in places, contains more than a half million tons of commercial mica.

TEXAS

Twin Star Industries, Inc. of Austin, is currently exploring a high-grade low-fluorine phosphate deposit near Concan in Uvalde County. The orebody is in Edwards limestone beneath a large cave that has been intermittently mined for bat guano for about 100 years; the phosphate rock has formed by leaching of the guano and precipitation of the phosphoric acids as calcium phosphate at a lower level. Figures on tonnage and grade are not yet available.

UTAH

Radium King Mines, Inc., will be a partner in merger of a number of Atlas Corp., controlled uranium companies, according to Joseph A. Minton, president of English Oil Co. English owns 22.7% of stock of Radium King, operating Ula mine in Utah's White Canyon district.

Atlas Corp. holds another 22.7% of the firm, as a result of recent sale of its Petro-Atlas Corp. oil properties to Amer-

Slake lime

in a fraction of the time...

with the

VISCOMATIC®

SLAKER

Slakes lime as a paste, which is then diluted and fed as a slurry, to give you—

- **1. Smaller particle size, resulting in *better* slurry for better process control.**
- **2. Substantial savings in lime through more complete slaking.**
- **3. Advantages of using cold water—no heat required.**
- **4. Control of water by viscosity of paste.**
- **5. Simple, trouble-free operation.**

New in conception, design and performance, the "VISCOMATIC" slaker is another example of the ultra-modern equipment that has brought INFILCO leadership in its field. It will help you improve both your processes and your products—save you time, lime and trouble. For complete information write today for Bulletin No. 255.

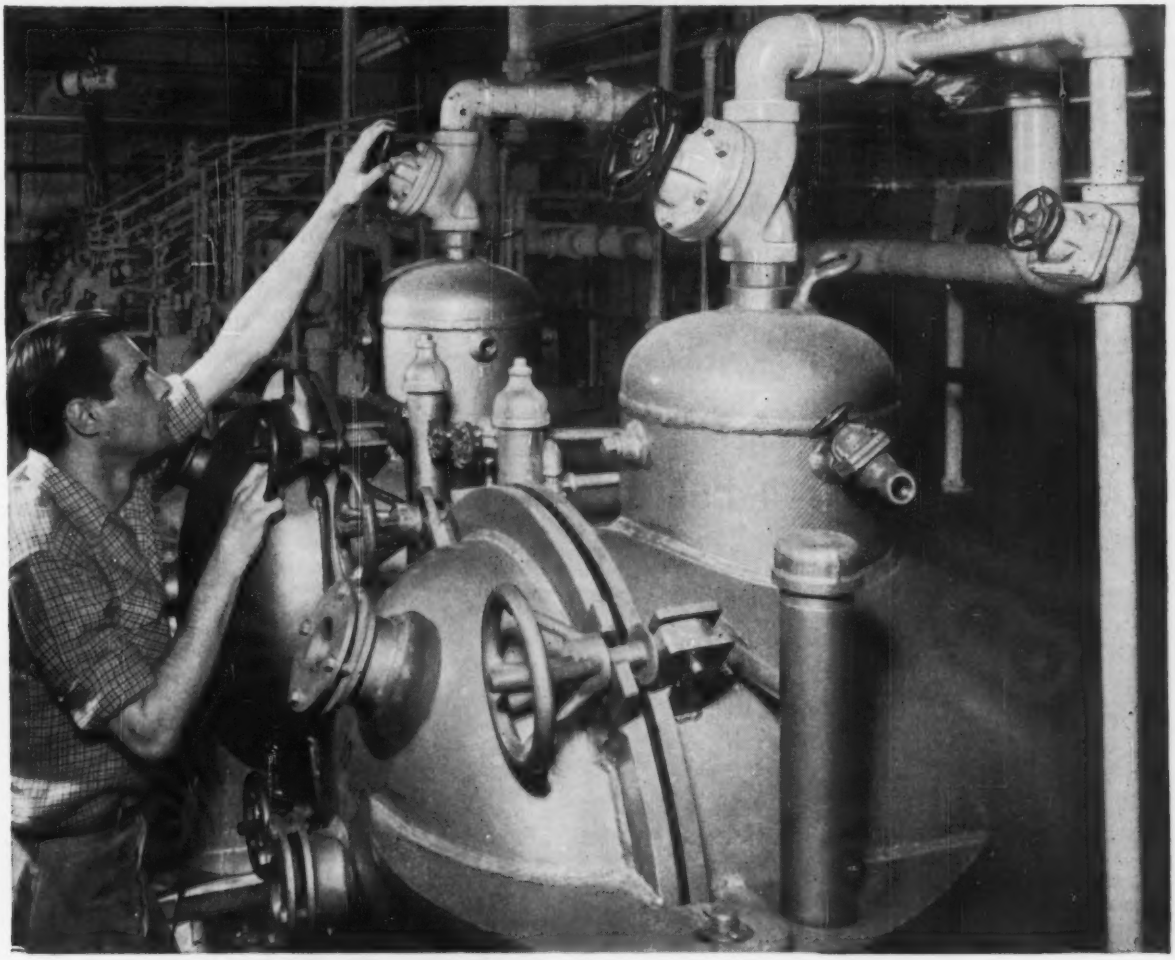
Special equipment and specialized experience of INFILCO in the Hydrometallurgical field can be interpreted to meet your problems in chemical feeding, leaching, oxidation, carbonating, precipitation and continuous ion exchange. Your inquiry is invited.

INFILCO

Infilco Inc.
General Offices • Tucson, Arizona • P.O. Box 5033
Field Offices throughout the United States and in foreign countries

The ONLY company IMPARTIALLY offering equipment for ALL types of water and waste processing—coagulation, precipitation, sedimentation, flotation, filtration, ion exchange and biological treatment. 5857T2

Packless valves assure Electron Products perfect processing



Crane diaphragm valves still hold tight after 18 months on 100-micron vacuum service

Electron Products Inc., Pasadena, Calif., forms special electronic parts of metalized paper. Processing—drying, deaerating, impregnating—is done under constant vacuum.

Valves, to hold the critical vacuum within a maximum leak rate of 100 microns for a 24-hour period during processing, had to be selected with care. Obviously not any valve would do. The choice—Crane diaphragm valves for high performance value.

After 18 months, these Crane packless valves continue to hold tight on this critical vacuum service for as long as 36 hours—and on occasion, over an entire weekend.

Crane packless diaphragm valves are widely used also in processing industries where absolute tightness is necessary to prevent leakage of volatile, corrosive and hard-to-hold fluids. Complete information is available from your Crane Representative. Or write for 24-page circular.

All about Crane diaphragm valves—patterns, body and trim materials, linings, 180 tested service suggestions, etc.—in Circular AD-1942. Send for it today.

CRANE VALVES & FITTINGS

PIPE • PLUMBING • KITCHENS • HEATING • AIR CONDITIONING

Since 1855—Crane Co., General Offices: Chicago 5, Ill.—Branches and Wholesalers Serving All Areas

Utah (*Continued*)

ican Petrofina. (American Petrofina gave Atlas its interest in Radium King as a result of this oil deal.)

Mr. Minton said that Radium King would obtain shares in a re-constituted and publically-held Hidden Splendor Mining Co., which would result from merger of present Hidden Splendor, Rio de Oro Uranium Mines, Inc., and Lisbon Uranium Corp.

Resumption of merger talks involving these and other firms was recently announced by Floyd Odlum, Atlas Corp. president. Radium King was not included in this announcement.

Utah Ore Sampling Co., Murray, has closed its doors after nearly 50 years service to the western nonferrous metals industry.

The firm, founded in 1909 by the fabulous "Uncle Jesse" Knight, Utah county mining figure, has some 200 stockholders scattered throughout the nation.

As time ran out on the life of the Defense Minerals Exploration Administration, the agency granted authorization for a major lead-silver-zinc-copper development in the Park City district of Utah.

While the domestic mining industry, particularly the independent mining segment awaited early action on extension of MEA as recommended by Interior Secretary Fred A. Seaton, the agency approved a program for the Utah industry and specifically the New Park Mining Co. amounting to $715,185.

W. H. H. Cranmer, veteran independent miner of the Rocky Mountain district, said that work on the three-year project prepared by NP vice president Clark L. Wilson, would begin at once.

The mining crew will be composed of lessees presently working and producing on properties of the Mayflower mine under the direction of New Park.

The DMEA program involves contracts for the driving of some 8600 ft of drifts and crosscuts in the west section of the mine on its 2,005-ft level (from surface) in search for bedded ore. This work will be carried out by contract, Mr. Cranmer said.

(The mining firm recently ended its employee-mining program, substituting an arrangement for lessees as a result of the dropping prices of lead and zinc. Since that date late in 1957, New Park has shown a net operating profit.)

Additionally, the DMEA will assist in a 10,000-ft diamond drilling program involving 20 exploratory holes as well as 20,000 ft of long hole exploration drilling through 75 other holes.

Other diamond drilling will be carried out to evaluate stratigraphy, etc.

"We are optimistic that we can uncover very substantial orebodies as the direction of the fissures is through this new ground. We are presently mining from bedded areas in which fissures have deposited metal values," Mr. Cranmer said.

A portion of the exploration will be conducted through ground owned by the United States Smelting Refining & Mining Co., on which NP has operating rights with eventual purchase rights.

Exploration in the DMEA would continue through the USSR&M ground onto adjacent holdings of New Park which have been acquired in the last 10 years by the Salt Lake firm.

The DMEA will put up a total of $282,440 on this project. This will be matched by NP. Additionally, NP proposes expenditure of $95,400 in purchase of new equipment, including pumps, etc. New Park also has committed an additional $54,905 to the exploration drive.

The project is one of the largest approved in recent years in search for lead-silver-zinc-copper values in the Park City district.

WASHINGTON

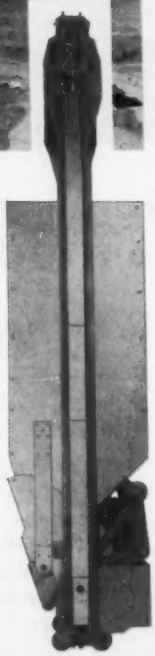
The Spokane office of the Defense Minerals Exploration administration announced three new contracts have been executed in the Pacific Northwest.

Capital-Seaboard corporation has a contract to explore for cobalt at the Long Dike claims in Lemhi County, Idaho. Contract is for $65,200, with government participation of $40,750.

Moneta-Porcupine Mines, Ltd., has a contract to explore for mercury at the Elkhead mine in Douglas County, Ore. Contract is for $15,624 with government participation of $7812.

CONNELLSVILLE SKIPS
...40 Million Ton Performance -Still Going Strong!

▲ International Minerals & Chemical Corp. recently hoisted the 40,000,000th ton of potash ore from the company's No. 1 Mine at Carlsbad, N. Mex. Equipped with Connellsville 13-ton Bottom Dump Skips, one shaft at the mine delivered as much as 14,464 tons in a twenty-four hour period!



For over 42 years, Connellsville Skips have established a record for unmatched performance and durability. Designed to meet specific haulage requirements, Connellsville Skips are safe, rugged and dependable through years and years of service . . . engineered for high speed and trouble-free operation.

Installing a new shaft? Revamping an old shaft? Either way, specify Connellsville Skips and profit through increased tonnage and low maintenance operation.

Connellsville Skips—*doing yeoman service from one end of the mining industry to the other.*

CONNELLSVILLE
MANUFACTURING & MINE SUPPLY CO.
CONNELLSVILLE, PA.
Serving the Mining Industry since 1901

Send today for bulletin!

Where the going gets rough...

get tough

with Lukens "T-1" Steel!

TRADE-MARK

LUKENS

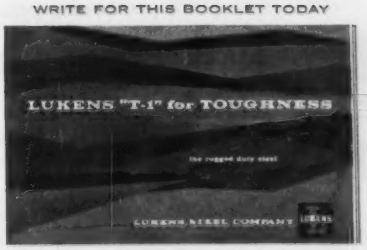
■ Wherever rock and gravel, coal and ores come in violent contact with machine and equipment parts, Lukens "T-1" steel—*especially extra tough 321 min. BHN quality*—fights back at wear and abrasion with spectacular success.

It is readily fabricated. You can form or weld it in the field or shop, from stock plate sizes immediately available. It can be used to replace or repair worn bucket teeth, truck and mine car bodies or liners, dozer blades, dipper sticks, crusher teeth, chutes, and many other parts.

Far stronger for its gage than conventional steel, it requires less metal to do equivalent jobs. It remains tough even at sub-zero temperatures.

Contact your nearest warehouse listed below, or write Manager, Marketing Service, 143 Lukens Building, Lukens Steel Company, Coatesville, Pennsylvania. Ask for special bulletin, *"Lukens 'T-1' for Toughness."*

WRITE FOR THIS BOOKLET TODAY



WAREHOUSES

Ashland, Kentucky, Mansbach Steel Co., 19th St. & River Front

Baltimore 2, Maryland, Wm. G. Wetherall, Inc., 317 President Street

Birmingham 2, Alabama, O'Neal Steel, Inc., P. O. Box 2623

Cleveland 6, Ohio, Mills-Wolf Steel Co., 10006 Carnegie Avenue

Los Angeles 33, California, The R. J. M. Company, 238 Mission Rd.

Montreal, Quebec, Can., Drummond, McCall & Co., Ltd., 930 Wellington St.

HELPING INDUSTRY CHOOSE STEELS THAT FIT THE JOB

Washington (*Continued*)

Western Fluorite Mining Company Inc., has a contract to explore for monazite, columbite and rutile in the Sand Basin placer area in Granite County, Mont. Contract is for $20,290 with government participation of $10,145.

Daybreak Uranium, Inc., Spokane, has announced a new drilling program at its property in the Mount Spokane district. Kae Sowers, secretary of the firm, said 30 holes are to be drilled to depths of up to 180 ft to probe ahead of the face of the company's underground operations at the Dahl lease.

Officials of the Great Northern Railway said that new rates on alumina shipped from Mississippi valley points to the Pacific Northwest would go into effect July 15. The rate on alumina will be cut from the present $12.66 a ton to $12.16 a ton.

Rates on pig aluminum and on aluminum plate and sheet shipped east from the Pacific Northwest were to be cut August 1, but the exact amount was not specified. The cuts on pig aluminum may amount to as much as 11% and those on plate and sheet as much as 6%.

Officials of Kaiser Aluminum and Chemical corp. said the move would be a "helpful factor." Kaiser Aluminum has curtailed operations in recent months because of market conditions.

Dawn Mining Co.'s uranium processing mill at Ford is expected to resume operations during the first part of July, J. J. Crowhurst, manager, said.

The mill was shut down June 15 because Dawn had fulfilled its contract on tonnage with the AEC for the first half of 1958. At that time, a majority of the 50 employees at the mill were put on a vacation status.

Crowhurst said that a new one-year milling contract with Silver Buckle Mining Co., Wallace, Idaho, became effective July 1.

The Silver Buckle firm has contracted to supply the mill with 60 tons of ore per day from an open pit mine on the Spokane Indian reservation. The firm is buying the property from Northwest Uranium Mines, Inc., also of Wallace.

Meanwhile, Dawn officials said that Dawn's operations at the company's mines on the Indian reservation have been continuing. About 1000 to 1100 tpd are being hauled from the company's mines to the mill stockpile.

WYOMING

Modern Mines Development Co. has shipped 13 carloads of uranium ore from the Pryor-Little Mountain area to the Fremont Minerals Buying station at Riverton in the past three months.

Forty two properties in four Wyoming uranium districts have received mining allocations from the AEC.

No definite allocation was given for the Shirley Basin area, southeast of Gas Hills.

The AEC allocated approximately 3600 tpd to be distributed through central Wyoming uranium mills between now and Dec. 31, 1966. The yearly average of ores will amount to about 1,296,000 tons, valued at about $20-million.

Allocations were made for mines in the Gas Hills, Copper Mountain, Crooks Gap and Pryor-Little Mountain areas.

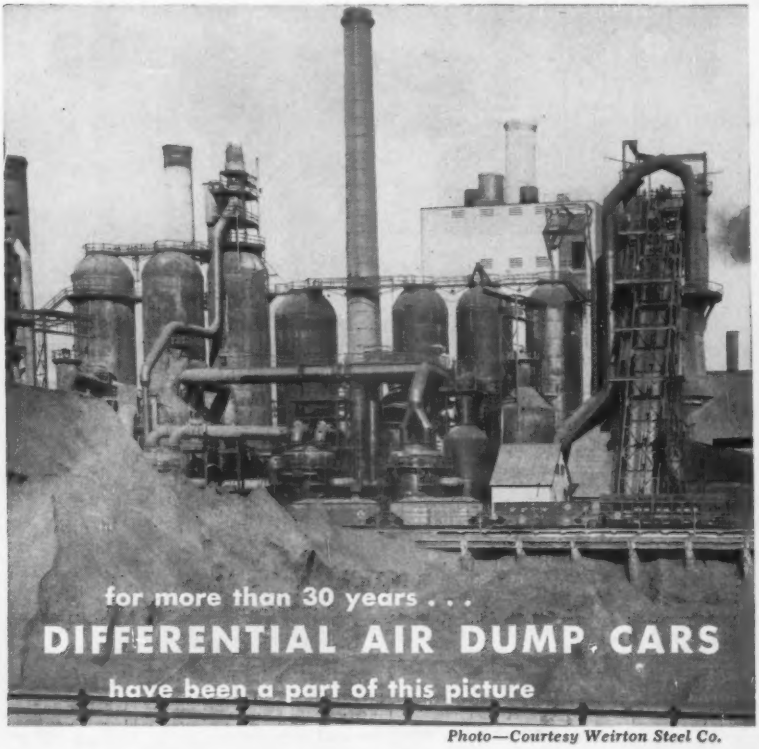
Shoni Uranium Corp. plans to stockpile about 30,000 tons of uranium ore this summer at the Bonanza Mine on Copper Mountain.

President Vern Hughes said 40,000 ft of drilling has been completed on Shoni property in the East Gas Hills area of Fremont County by Vitro Minerals Corp. He also announced plans to reactivate the Cheyenne mine on Beaver Rim, about 25 miles southeast of Riverton.

Drilling near the Fanny Mae Mine of P-C Mining Corp. in the East Gas Hills area of Fremont County has uncovered a new vein of uranium ore.

General manager John Cummings said the latest discoveries are between 50 and 100 ft below the surface. The vein extends over at least 1,500 ft, judging from drilling results, Cummings said. Ore was previously discovered at lower levels.

Columbia-Geneva Division of U. S. Steel



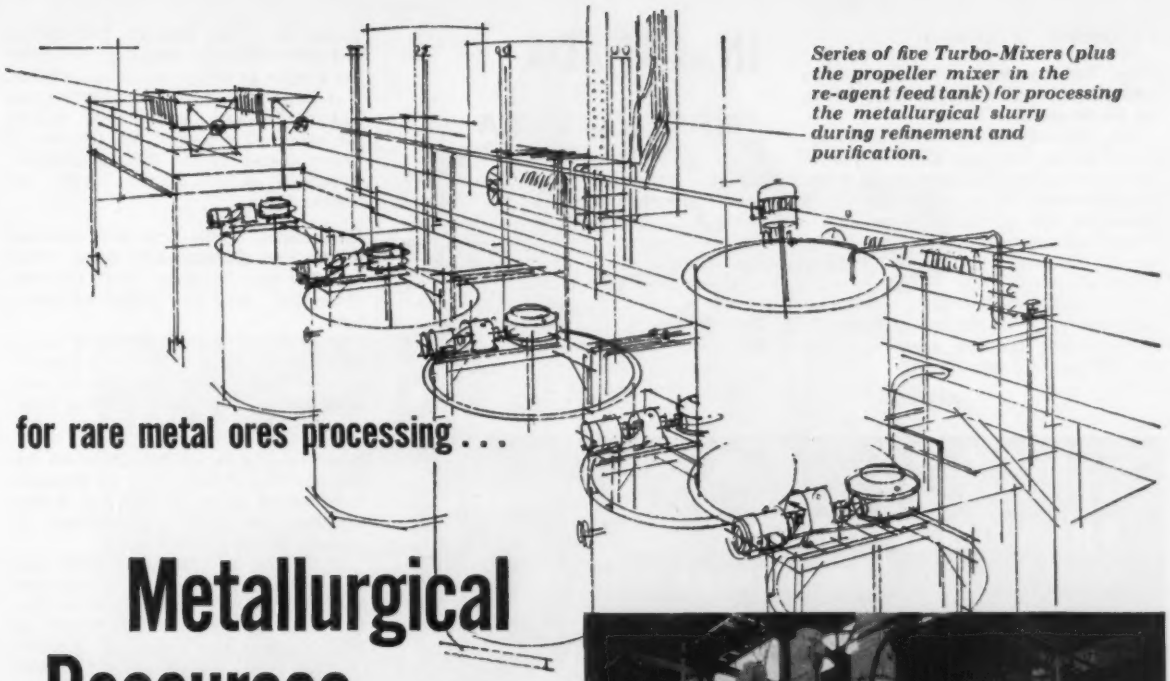
Photo—Courtesy Weirton Steel Co.

Growing with the mighty steel industry, answering the need for Gibraltar tough dump cars that can stand the punishment which only a steel mill can hand out, Differential cars have made many fast friends among steel's "men who know".

A substantial growth in sales — including many repeat orders — reflects a recognition of the quality and performance built into Differentials.

D
DIFFERENTIAL
STEEL CAR COMPANY
FINDLAY, OHIO

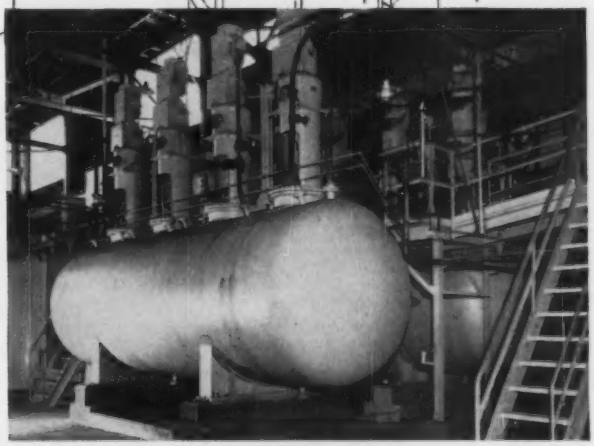
SINCE 1915 PIONEERS IN HAULAGE EQUIPMENT



Series of five Turbo-Mixers (plus the propeller mixer in the re-agent feed tank) for processing the metallurgical slurry during refinement and purification.

for rare metal ores processing . . .

Metallurgical Resources chooses TURBO-MIXERS



Four-compartment autoclaves for pressure leaching of ore. Each mixer consists of a mixing and aeration assembly to accomplish the contacting of the liquid-solid-gaseous phase system.

There is no easy way to extract rare metals from their ores. Processing plants, such as that of Metallurgical Resources, Inc. of Newburgh, New York, call for skillful design and dependable processing equipment. To help put this new plant "on stream", Turbo-Mixer custom made all of the equipment required.

Turbo's 45 years of experience in design . . . Turbo's record of dependability . . . and Turbo's single-source responsibility make the difference. If you are in the process of selecting or specifying mixing equipment, call on Turbo. You'll find . . . *it pays to plan with General American.*

FOR DETAILED INFORMATION AND USEFUL DESIGN DATA, SEND FOR THE FOLLOWING BULLETINS:

Please send me the following Turbo-Mixer Bulletin (s):

General Turbo-Mixer Bulletin_____

RDC Extraction Column Bulletin_____

Side Entering Propeller Mixer Bulletin_____

Absorption & Oxidation Bulletins_____

TURBO-MIXER DIVISION
GENERAL AMERICAN TRANSPORTATION CORPORATION

Sales offices: 380 Madison Avenue, New York 17, New York • General Offices: 135 South LaSalle Street, Chicago 90, Illinois • Offices in all principal cities

Wyoming *(Continued)*

Corp. has exercised an option to buy 9.63 cfs of water from the Hays Ranch on the Sweetwater River.

The $59,000 transaction followed approval by the Wyoming board of control of Columbia-Geneva's application to appropriate water for its proposed iron ore processing mill at Atlantic City.

State approval was necessary to change use of the water from agricultural to industrial.

The steel firm has been conducting extensive tests to determine feasibility of developing the low grade iron ore deposits near Atlantic City.

IN CANADA

BRITISH COLUMBIA

Crews surveying British Columbia's Rocky Mountain Trench for the Wenner-Gren B.C. Development Co. have already staked "many" mineral claims in the northern region of the province.

"Interesting mineralization" has been found in a number of locations in the Trench where the Swedish Wenner-Gren interests propose to develop a 3-million-kw hydroelectric, metallurgical project at a cost between $400-million and $600-million. It would involve building a series of dams on the Peace River.

A report by Lundberg Explorations Ltd. of Toronto states that all staking has taken place outside the area placed under reserve by the B.C. government. Lundberg is doing the survey for Wenner-Gren.

Encouraging results have been obtained in the first diamond-drill holes driven by Mid-West Copper and Uranium Mines Ltd. since the revival of operations.

Hole No. 1 has hit 20 ft of strong gold mineralization 150 ft from a station on the 7-level of the company's mine at Rossland, and hole No. 2 has penetrated 45 ft of bornite.

Noranda Exploration has taken an option on about 130 Graham Bousquet Gold Mines claim in Highland Valley, according to T. J. Day, president of Graham Bousquet.

Under the agreement, Noranda must do certain assessment work and may form a 3-million-share company by Nov. 1, 1959. Graham Bousquet would get 750,000 shares, giving Noranda an option on 240,000 of these shares for $210,000.

The claims are in two groups designated the D.M. and Afton, and reportedly contain interesting copper showings and large anomalies.

Golden Slipper Mines has acquired an option on the Cougar group of 36 claims in the southern section of Highland Valley. An immediate examination of the property will be made by C. Rutherford, consulting engineer.

Rexspar Uranium & Metals Mining Co. Ltd. has taken options on a new uranium discovery near its main property at Birch Island, B.C., according to Philip Joseph, president. The option provides for cash and royalties on ore mined, payable to the prospectors who made the find. A small camp is being set up.

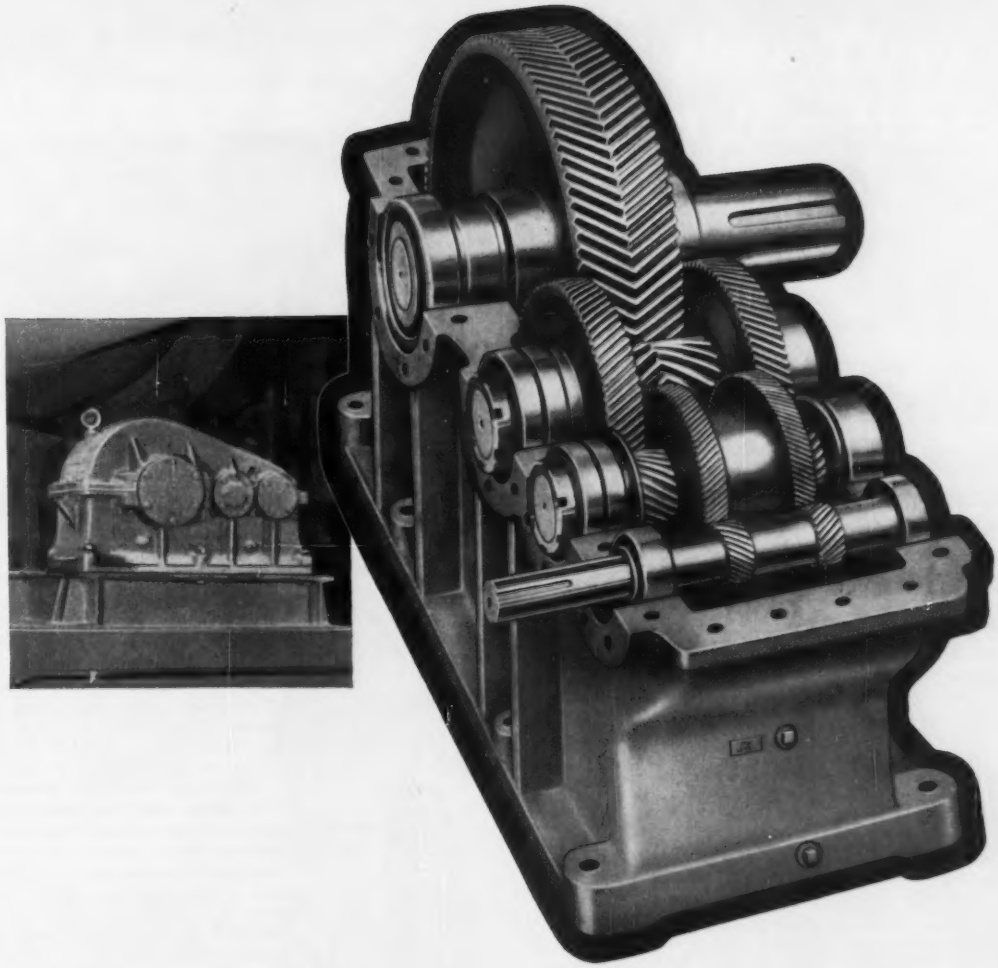
Two gold prospects in B.C. were staked during the past year by Transcontinental Resources Ltd. of Vancouver and Toronto, according to the annual report. Brikon Explorations Ltd., in which Transcontinental has a substantial interest, staked five base metal showings in the Northwest Territories.

New Taku Mines Ltd., which closed its northern B.C. mine and mill last August because of low base metal prices, could resume operations on short notice, and will when prices improve. New Taku is an associate of Transcontinental.

Another associate, Yukon Explorations Ltd., reported an operating profit of $49,328, on production, including gold bonus, of $295,047.

Several areas of high reading have been recorded together with numerous areas of limestone outcropping and other geological markers on Torwest Resources Ltd.'s 14-claim property south of the Craigmont property at Merritt. A special concentration is now being made on the Jenny No. 1 and No. 2 claims, which are the most easterly and which are

TRIANGLE BRAND
COPPER SULPHATE
for
FLOTATION
For more than fifty years TRIANGLE BRAND COPPER SULPHATE has been the accepted activator for the removal of sphalerite from lead-zinc ores. It is 99% + pure and available in several sizes to meet your requirements.
PHELPS DODGE REFINING CORP.
300 PARK AVE. NEW YORK 22, N.Y. • 5310 W. 66th STREET, CHICAGO 38, ILL.



THE HEAVIER THE LOAD . . . THE MORE YOU NEED

PHILADELPHIA HERRINGBONE REDUCERS

Heavy repeated shock loads . . . high horsepower . . . round-the-clock operation . . . put them together and you have the kind of a job where Philadelphia Herringbone Reducers perform best. They will last longer and save your maintenance dollars because extra strength is built into every part . . . housings, shafting, bearings and gearing.

To be specific:

Housings are specially reinforced at points of greatest stress. Extra heavy bearings take shocks and heavy overhung loads in stride. Result: shaft alignment is accurate . . . and it stays accurate. Gears, pinions and bearings last longer.

To meet the specific needs of each application, gearing is specially designed and symmetrically arranged in the housing. Result: the bearings on each shaft carry equal loads, shaft deflections are minimized, bearings and gearing have higher shock load capacity.

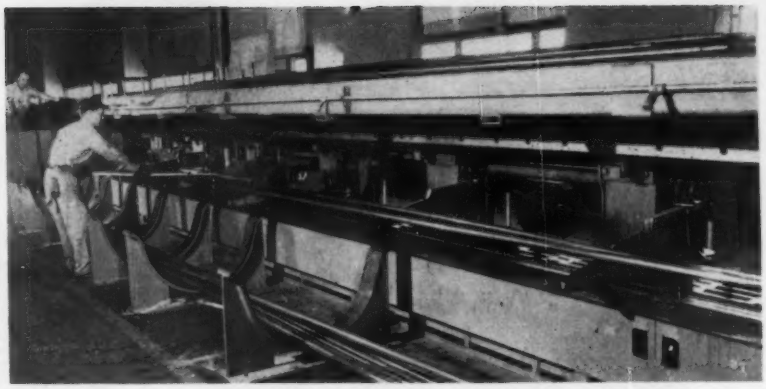
Pound for pound, horsepower for horsepower and dollar for dollar, you can't buy a herringbone reducer that will outlast a Philadelphia. They are designed with *your* heavy duty drive problems in mind . . . so that you will never have a drive problem.

Philadelphia Herringbone Reducers are available in single, double and triple reduction for ratios of 1.75:1 to 292:1. Write today for your copy of Catalog H-55.

PHILADELPHIA GEAR CORPORATION
Erie Avenue and G Street • Philadelphia 34, Pennsylvania

philadelphia gear drives

Offices in all Principal Cities • Virginia Gear & Machine Corp., Lynchburg, Va.
INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS



DRAWING of seamless copper is one of the ultra-modern departments of the new subsidiary of Anaconda plant, which has an annual capacity of 30-million lb of product.

"...reduces blasting costs, gives better fragmentation, drills 300-400 ft. of 9" hole in hard sandstone per shift."

PORTADRILL MODEL **105TA**

SPEEDS HOLE PRODUCTION! CUTS COSTS IN STRIPPING, QUARRYING AND CONSTRUCTION OPERATIONS

- Combines faster hole completion and Portadrill exclusive design features with manueverability and power of the EIMCO 105 diesel tractor prime mover.
- Compressed air operation lengthens bit life, ends freezing and water problems; eliminates auxiliary equipment.
- Utilizes standard roller cone rock bits or rotary-percussion "down-the-hole" tools for hard rock drilling.
- One or two man operated. Greater manueverability assures correct spacing for lower explosive cost and better fragmentation.
- Lower initial cost and lowest operational cost of any comparable capacity drill.

Get complete details on the 105TA and how it will speed your hole production; cut drilling, blasting and removal costs in stripping, quarrying and construction operations. Address:

PORTADRILL
REG. U.S. PAT. OFF.

Mfg. by the WINTER-WEISS COMPANY
2201 Blake St., Denver 5, Colo., USA
—EXPORT AGENTS—
Rocky Mountain Export Co.
2011 Glenarm Place Denver 2, Colo.
Cable: ROMEXCO

Ask about other Portadrill models for exploration; mineral sampling; blast hole shallow oil production; water well operations. Capacities to 2,000′ depths and up to 60″ diameter vertical hole operations.

American Brass Opens New Plant

JULY 1 saw the opening of the West Coast's newest copper-copper alloy mill, when American Brass Co., a subsidiary of Anaconda Co., opened its $18-million facility at Paramount, Calif.

Board chairman John A. Coe of Waterbury, Conn., headed a delegation of executives who were hosts at ceremonies in Paramount, near Los Angeles. C. Russell Epley is vice president in charge of the company's new division.

"The rapid industrial growth of the West Coast and the enthusiastic support we have received from users of our products made apparent the need for a basic mill to serve this area," Mr. Epley said. "The American Brass Co.'s new plant here meets this need and reflects our faith in the future growth of West Coast industry and of our country."

The plant itself extends over seven acres, and is located on a 48-acre plot, east of Garfield Ave. and north of Compton Blvd. Its modern equipment produces copper, brass and bronze in the form of tube, sheet, strip, rod, drawn products and special shapes. The annual rated capacity is 30-million lb. When in full operation, the mill will furnish employment for some 500 persons.

Design, engineering and contracting supervision were executed by Anaconda's engineering department of New York, N. Y. The general contractors were Rosendahl Corp. of Los Angeles, and supply and erection of steel was by Bethlehem Steel Co., Pacific Coast Division.

B.C. *(Continued)*

immediately adjacent to the area in which Noranda Exploration Co. Ltd. is conducting an active drilling program.

QUEBEC

Sparked by copper find secured by New Hosco, the Mattagami area in the northwest section of the property has become the scene of intense activity with a score of companies moving in. The rush is the second to have developed in the area, the first, occurring

Largest Crane on Rubber Tires works on "Richest Hill in the World"

A 75-ton Lorain Moto-Crane is erecting 2048 tons of steel at Anaconda Copper's Berkley Pit Project near Butte, Montana, where three conveyers, totaling 2000 feet long, are being built to transfer ore from the open pit to loading bins.

It is on big jobs like this that the Lorain MC-875, the biggest rubber-tire crane, proves its worth. The massive Lorain-designed-and-built carrier has a frame of a single-piece, box-section, alloy steel casting designed to defy the deflections and torsional stresses of heavy-duty crane service.

Job-proven "Shear-Ball" turntable mounting distributes loads over more than 70 hardened steel balls — eliminates maintenance, adjustment, lubrication problems of older style roller designs.

2-Lever, "Joy-Stick" air power controls are simpler, easier, faster — fewer motions, less operator fatigue.

The Square-Tubular-Chord Boom is stronger and lighter; it permits greater capacities, wider ranges, greater lengths.

Not everyone can use a rubber-tire crane of this size, but where the demands are greatest, this is the crane for the job. Comparable outstanding performance and design advantages also are available in other Lorain sizes starting at 7 tons — on rubber tires or crawlers. See your Thew-Lorain Distributor for details.

This 75-ton Lorain Moto-Crane, model MC-875, has been on the job daily since June, 1957. Here are some of the jobs it has performed:

1. Unloaded 49-ton crusher jaws.
2. Erected 18-ton conveyor gallery spans, 106 ft. long.
3. In this picture, it's using a 120-ft. boom, plus a 30-ft. tip extension, to erect the 90-ft. high machine house. (This long-range D-3 boom is extensible to 200 ft., plus a 40-ft. tip extension.)
4. Has walked all over the job with a 120-ft. boom, including travel under telephone wires only 20 ft. high.

THE THEW SHOVEL CO.
Lorain, Ohio, U.S.A.

RELIABILITY IN ACTION / THEW LORAIN®

Quebec *(Continued)*

last year, following the Mattagami Syndicate's discovery of a major zinc-copper-gold-silver orebody.

New Hosco has intersected a zone which has all the indications of what may prove to be a major zone with first results running 3-4% or more in copper plus good values in zinc. The find is located approximately six miles northwest of the Mattagami Syndicate's orebody, thus opening a whole new sector for exploration.

Companies with property in the area on which work is in progress or planned include O'Brien Gold Mines, D'Aragon Mines, Mining Corporation of Canada, Conwest Exploration, Roche Mines, O'Leary Malartic, Phelps Dodge Corp., Marchant Mining, New Calumet and East Sullivan.

Five drill machines are now in operation on the Mattagami Syndicate's ground under sponsorship of Noranda Mines, McIntyre and Canadian Exploration. Some 30 holes put down by the Syndicate last year reportedly outlined 14-million tons averaging 11.53% zinc, 0.66% copper, 0.016 oz gold and 1.11 oz silver to relatively shallow depth.

Barnat Mines has indicated an entirely new orebody in flat diamond drilling from the 900-ft level of its gold producing property in the Malartic area. The find promises to add substantially to the indicated life of the mine. Initial intersections ranged from 150 to 463 ft with averages from $4.90 (cut grade at $35 per oz gold) to $6.51 per ton.

Three diamond drills are in operation on the property of Wiltsey-Coghlan Mines adjoining east of Noranda Mines in the Rouyn area. Work is being aimed to test an area where mineralization was indicated in shallow work along a length of 2,000 ft. Present drilling is being pushed below 1,000 ft with first holes picking up sulphide mineralization below that depth.

Chesbar Chibougamau has acquired what appears to be a promising iron (magnetite) propert in the Waswanapi Lake area about two miles north of Miquelon. Assaying along a length of some 2,000 ft of trenching has given an average of 34% iron. Two diamond drill rigs are now testing the zone. The property consists of 110 claims in Bosse and Duplessis Twps. Magnetometer survey indicated an anomaly of some 6,000 ft with widths varying from 100-600 ft. Metallurgical tests indicated the material amenable to concentration.

Portage Island (Chibougamau) Mines is embarking on an extensive diamond drilling program on its Chibougamau property. Intention is to carry out some 25,000 ft of diamond drilling of which about 17,000 ft is to be done on the island this summer. In addition to tests on three copper zones, it is planned to probe indicated iron potential. One iron zone has been traced for 8,000 ft with another zone of about 5,000 ft parallel and to the north.

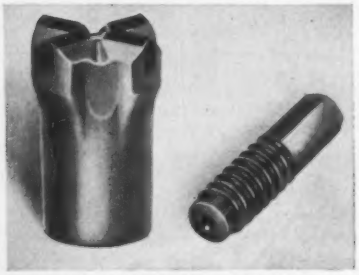
Jilbie Mining Co. is currently testing placer gold prospects on its property in the Beauceville area in the Eastern Townships. Present work consists of geological work, panning, and seismic survey. Churn drilling is also planned to follow up indications obtained.

Exploration work is under way on several properties in the Cape Smith-Wakeham Bay area in Ungava district. La Compagnie Miniere de l'Ungava (Timmins controlled) has scheduled a drilling program on its copper-nickel concession following up indications obtained in last year's work and testing other indications secured in geophysical work carried out this year. Other companies planning work in the area include Raglan Nickel Mines and Murray Mining Corp. Tempo of exploration work in the area has subsided somewhat from last year.

Hilton Mines, an iron producer near Shawville, expects to reach optimum production of 600,000 tons per year late in 1958. Steel Company of Canada holds 50% interest, and Bristol Quebec Mining Co. (subsidiary of Pickands, Mather & Co. of Cleveland, Ohio) holds the remaining 50%.

Beauce Placer Mining Co. has obtained encouraging results in testing its placer

WHY NOT DRILL THE LOW COST WAY?



Brunner & Lay carbide Rok-Bits available in these body types—cross, chisel, "X", cutaway, taper socket. Furnished in standard wagon and hand held drill threads—also 1,000, 700, 600, 400, 200 (1½, 1⅝, 1¾, 1⅞, 2, 2⅛ and 2¼" gauge), J5.23, J7.5 threads. Wide size range, up to 7" in our Hole-Master.

Drilling 20 to 30 ft. blast holes is by all odds the fast, low cost method for most operators today. Brunner & Lay has the accepted tools for such medium long hole drilling—#200 carbide Rok-Bits and ⅞" hex. alloy sectional steel. Our experience is at your disposal. We will advise you frankly, in confidence and without obligation. Phone our nearest plant —or see us at MINING SHOW, Booth #1611. Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill. **76 progressive years.** Plants & warehouses: Philadelphia, Asheville, Birmingham, Dallas, Albuquerque, Denver, Los Angeles, Sacramento, Portland, Seattle, Montreal.

PICK YOUR DRILL STEEL
ORDER FROM OUR NEAREST PLANT

	Shapes & Sizes
Standard Carbon	Hex.: ⅞, 1; Rd.: 1, 1⅛, 1¼"
Sectional Carbon	Hex.: ⅞, 1; Rd.: 1, 1⅛, 1¼"
Sectional Carbon	Rd.: 1½, 1¾, 2"
Standard Alloy	Hex.: ⅞, 1, Rd.: 1⅛, 1¼"
Sectional Alloy	Hex.: ⅞, 1, 1¼"
Intraset (alloy)	Hex.: ⅞, 1; Rd.: 1⅛, 1¼"

All standard threads.

Let us recondition your drill steel. Prompt, efficient service at our many plants, from coast to coast.

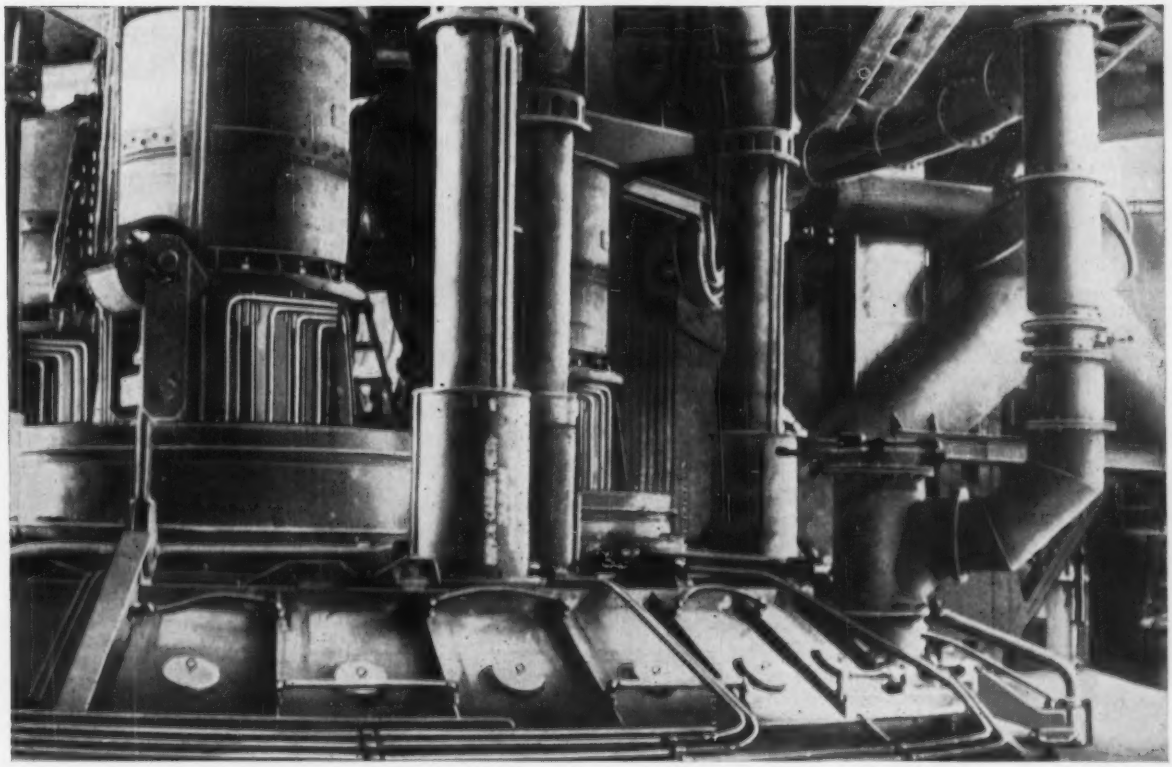
Write for new bulletin DA 1-58.

Brunner & Lay Products

CARBIDE ROK-BITS • INTRASET STEEL • DRILL RODS • COUPLINGS, ADAPTERS & SECTIONAL STEEL

98% gas recovery
from completely covered, sealed-so-tight

LECTROMELT-DEMAG ELECTRIC SMELTING FURNACES



THE *first* completely covered, tightly sealed smelting furnaces were developed by Demag . . . and the Demag design has *never been surpassed!*

Gas-tight passage of movable electrodes through the roof forms a friction-free seal . . . so effective that 98% of valuable furnace gases are recovered. Roof lifting gear makes start-ups and inspection of interior furnace conditions easier. Retractable feed chutes regulate mix level of charge . . . furnace operates as efficiently at reduced as at full loading.

And now these and many other exclusive advantages of Demag design are available from Lectromelt . . . America's outstanding producer of electric furnaces. This unmatched Lectromelt-Demag combination of skills affords way-ahead efficiency, economy and safety in electric smelting furnaces.

For help in meeting any furnace requirement, contact Lectromelt Furnace Division, McGraw-Edison Company, 322 32nd Street, Pittsburgh 30, Pennsylvania.

Lectromelt*

*Reg. T. M. U. S. Pat. Off.

McGRAW EDISON

CANADA: Canefco Limited, Toronto . . . ARGENTINA: Master Argentina, Buenos Aires . . . ITALY: Forni Stein, Genova . . . ENGLAND: Electric Furnace Co., Ltd., Weybridge . . . GERMANY: Demag-Elektrometallurgie, GmbH, Duisburg . . . SPAIN: General Electrica Espanola, Bilbao . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Stein & Roubaix, Bressoux-Liege . . . JAPAN: Daido Steel Company, Ltd., Nagoya

WANTED

Rare Earth Properties

CONTAINING Yttrium group or "heavy" rare earth elements: Xenotime, Gadolinite, Euxenite, Samarskite, or similar types of ores.

*Reg. U.S. Pat. Off.
RE-58-2

Tell us what you have. Write:
RARE EARTHS AND THORIUM DIVISION
MICHIGAN CHEMICAL CORPORATION
P.O. Box 481, Golden, Colorado • or Saint Louis, Michigan

UNDERGROUND OR ON THE SURFACE

YOU'LL CUT EXPLORATORY COSTS IN HALF WITH THESE DIAMOND CORE DRILLS

SUPER PIONEER

Here's a rugged compact light-weight drill you can take anywhere. The Super Pioneer eliminates guesswork by giving a true core sample to depths of 100' or more. Designed for one-man operation, drills at any angle in all formations. Gasoline-powered drill and pump weigh just 35 lbs. each.

Basic kit includes drill, pump, and accessories. Rods and bits additional.

$885.00 FOB Spokane

SUPER SCOUT

This all-new air-powered one-man drill sets up and tears down in minutes, eliminating lengthy traffic tie-ups. Hand operated hydraulic feed supplies drilling pressure up to 1500 lbs. Anchor column provides drill support at any angle with or without back wall. Drills in any direction or at any angle to depths up to 100' with exceptionally high core recovery. Weighs just 85 lbs.!

Complete unit includes drill, hydraulic feed, anchor column, hoses, 50' of rods, core barrel, starting barrel, collar pipe, tools, and storage box.

$1175.00 FOB Spokane Diamond bits additional

DIAMOND DRILL CONTRACTING CO.
S. 18 STONE ST. SPOKANE, WASH.

Eastern and Southwestern Distributor, SPRAGUE & HENWOOD, Inc., Scranton, Pa., Grand Junction, Colo. • Export Representative, PHILIPS EXPORT CO., 100 E. 42nd St., New York, N. Y. • Western Canada Distributor, AIR POWER Ltd., Vancouver, B. C.

Quebec *(Continued)*

gold prospects in the Beauceville area, Chaudiere Valley, Eastern Townships. Initial objective is to prove up sufficient ore to initiate dredge operations. Churn drilling is currently in progress to probe the most favorable areas on the Gilbert River and Caron Creek holdings. The company has extensive acreage in the area and several locations have yet to be tested. New York-Alaska Gold Dredging Corp. is managing the operation.

ONTARIO

Can-Fer Mines, a recent Ontario incorporation, plans to test iron possibilities on its property in the South Onaman area. Ground magnetometer work has been completed in the west-central portion of the claims. A complex magnetic zone has been indicated to extend over a length of 4½ miles and averaging some 1200 ft in width.

Agnico Mines, the former Cobalt Consolidated Mining Corp., is achieving excellent results from its high grade vein in the Christopher mine in the Cobalt area. The vein, which was located in development work some months ago, has proven to be a bonanza. Indications are that the vein will continue to provide top grade silver ore for some time to come.

Production at Steep Rock Iron Mines this year will be well below that of last year if shipments for the first half of this year are any guide. To June 1958, shipments were down some 40% and unless steel demands increase, even further reduction may be anticipated.

Willroy Mines, base metals producer operating in the Manitouwadge area, has come up with what may be an entirely new zone. Exploratory diamond drilling has picked up zinc and silver values across favorable widths some 300 ft east of the shaft. Further drilling is to be done to test the zone.

Macassa Mines is operating at an increased milling rate of close to 500 tpd at its gold producing property in the Kirkland Lake area. The shift to higher mill capacity was completed earlier this year. Grade is being maintained at high level with average running close to $15 per ton. The company is currently operating at costs below those for which benefits under E.G.M.A.A. may be claimed—an indication of the efficiency of the operation and of the steady improvement in grade milled.

Bicroft Uranium Mines, operating in the Bancroft area, is milling better than 1,300 tpd. The company has worked up production above that required to fulfill its uranium contract with Eldorado Mining and Refining. Additional outlets for surplus output are being sought. Grade of ore treated has been maintained with broken ore reserves averaging over $19 per ton.

Upper Canada Mines has made excellent progress in its depth development

Digging iron ore on the Mesabi Range near Aurora, Minnesota.

MARION 151-M—Power For Unmatched Digging in Mines and Quarries

A Marion 151-M in action is a familiar sight in many parts of the iron range, in copper mines, coal pits and quarries throughout the world. This 7-yard machine is ruggedly built throughout with ample power for continuous, high-speed production. It is readily convertible to dragline service with boom lengths from 80′ to 120′ and buckets from 4 to 8 yards.

A 40-ton Marion 43-M truck crane loads 69,000 pounds at 13 feet. Such standard features as a torque converter, Marionair Control, power raising and lowering of the gantry and ballast give the operator big advantages. The strong, highly mobile carrier provides maximum maneuverability during travel and on the job.

Consult Marion Mining Specialists for lower costs on your property.

MARION

MARION POWER SHOVEL COMPANY—MARION, OHIO, U. S. A.

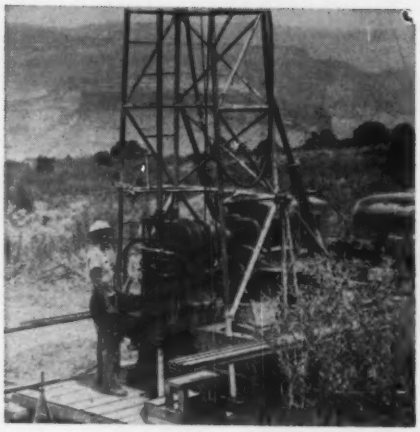
A Division of Universal Marion Corporation

WHAT ARE YOUR RESERVES?

•

LET US HELP YOU FIND OUT

•



Coal in Kentucky . . . Uranium on the Colorado plateau . . . Bauxite in the Ozarks . . . Limestone in Pennsylvania . . . Copper in Montana . . . These are but a few examples of the extent of our operations. Throughout the United States and even in many foreign countries we have successfully explored and proved ore reserves for our many customers, and where normal methods have failed, special techniques have been developed. In the Gas Hills Area of Wyoming, for example, we successfully cored the loose sand and siltstone where others had failed by "freezing" the material. Our personnel and equipment are stationed throughout the United States awaiting your call.

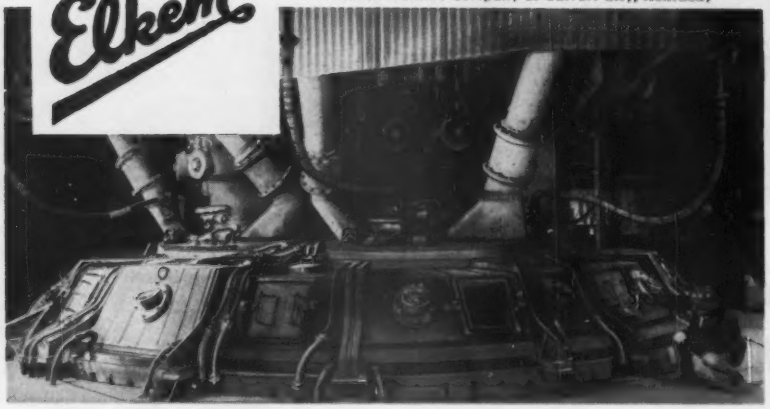
SPRAGUE & HENWOOD, Inc.
SCRANTON 2, PA.

S&H SINCE 1853

New York—Philadelphia—Atlanta—Pittsburgh—Grand Junction, Colo.—Buchans, N.F.

Elkem

Furnace Platform of 1 of 4-39,000 KVA ELKEM CALCIUM CARBIDE Furnaces installed by National Carbide Company at Calvert City, Kentucky



ELECTRIC SMELTING FURNACES

For the production of: CALCIUM CARBIDE — FERRO ALLOYS — PIG IRON — COPPER MATTE — NICKEL MATTE — PHOSPHORUS etc. The Soderberg self-baking Electrodes for smelting, melting and aluminum furnaces.

In existence for over 50 years, Elektrokemisk has served as consultants and constructors of smelting plants and aluminum reduction cells.

Leaders in metallurgical plant design and erection, Elektrokemisk has introduced Soderberg self-baking electrodes and furnace construction in over 30 countries all over the globe.

ELEKTROKEMISK A.S.

Write for our catalogs:

HEAD OFFICE: OSLO, NORWAY

U.S. OFFICE: 101 Park Ave., N. Y. 17, N. Y.

Ontario *(Continued)*

program at its gold producing property in the Kirkland Lake area. Main shaft is being extended from 3,747 ft to 4,600 ft to provide additional five or six levels. Decision to deepen the shaft was made following discovery of higher grade ore on the previous deepest levels above 3,625 ft. Diamond drilling also indicated depth extension of the ore zone.

International Ranwick started production recently at its Matachewan area molybdenum-copper property. Mill rate is approximately 125 tpd. A small stockpile has been built up on surface to supplement underground mill feed. Molybdenum concentrates have been sold 50% at fixed price and 50% at prevailing market rates. Copper concentrates are being shipped to the Noranda smelter.

Delnite Mines has been opening better grade ore than mine average of recent years in development of the new deep levels at its gold producing property in the Porcupine area. Earnings have improved accordingly. Deep diamond drilling has indicated extension of ore zone into block of ground being opened by three new levels. However, it is not anticipated that full benefits of the new development will be fully felt much before a year or so. Grade has continued to climb.

SASKATCHEWAN

A new scientific appraisal has dampened predictions that the Athabasca oil sands —largest reserve of oil known to man— would some day yield up an estimated 200-billion barrels of oil.

According to Alberta Research Council, less than one-tenth of this amount is ultimately recoverable, barring such techniques as heating the viscous oil with nuclear energy in order to improve the flow.

The oil sands are located as an oil-soaked area on the banks of the Athabasca River 300 miles northeast of Edmonton and close to the Saskatchewan border.

Until recently the potential recoverable reserves were placed at between 100-billion and 300-billion bbl. Last year Royalite Oil Co. began a $50-million project to extract oil by a centrifugal method.

Dr. N. H. Grace, director of research for Alberta Research Council, now states that 23-billion bbl can be recovered, given existing technologies and world demand and prices for oil.

The oil was difficult to extract, said Dr. Grace. Nonetheless, he added, "the first 1-billion bbl can be expected to enter the crude market before long." Just how long he did not say, except that "it is going to be much sooner than some of us think."

The research council estimates in-place potential reserves at above 200-billion bbl, most of which could never be recovered.

Have you tried SEMI-AUTOMATIC HARD-FACING with STOODY WIRES?

Semi-automatic hard-facing is fast taking hold in all industry! Here's a process that *removes much of the labor of welding* and is 2 to 4 times *faster* than manual application. Weldors can see the weld —wires are fed bare; no submerging flux or flux dams are required. Welding is continuous, feeding from layer wound coils...no stub ends, no lost time changing electrodes. With higher speed there is lower heat input, less penetration of the base metal and reduced dilution of deposits...hence higher wear resistance than with manual electrodes of similar analysis.

WHAT CAN YOU HARD-FACE SEMI-AUTOMATICALLY?

Virtually all large parts now hard-faced manually ...crusher rolls, mill hammers, impact crusher rotors, shovel and tractor parts, tool joints, dredge pump impellers and casings, muller tires, etc.

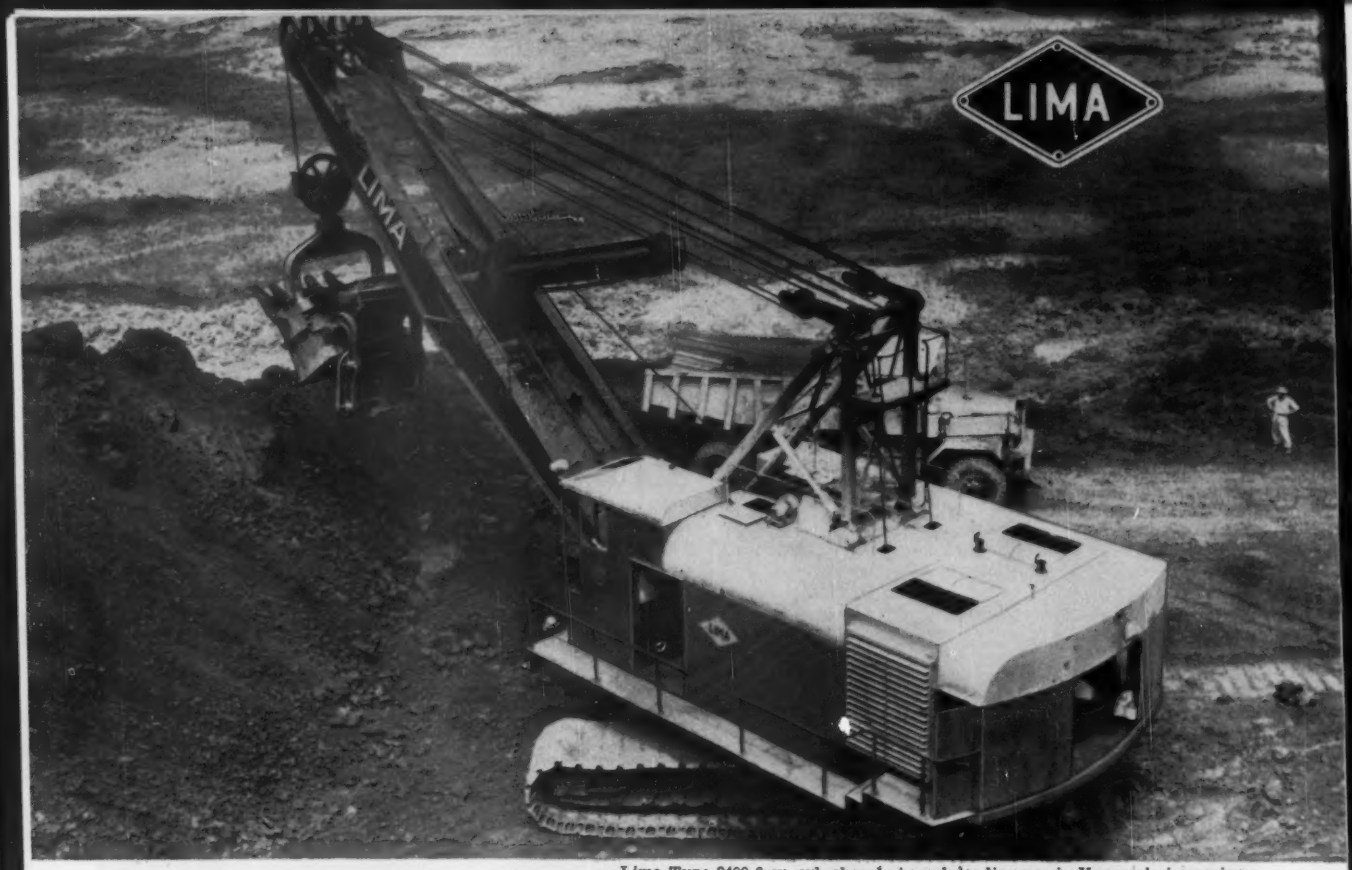
ASK FOR DEMONSTRATION—Most Stoody distributors (check the yellow pages of your phone book) are equipped to demonstrate Stoody Semi-Automatic Hard-Facing *right on your job!* Ask your distributor to arrange a demonstration today!

STOODY SEMI-AUTOMATIC WIRES—Now available in 11 types for *maximum* wear resistance under *every* wear condition!

SEE THE STOODY OPERATING DISPLAY AT THE MINING SHOW, SAN FRANCISCO, SEPTEMBER 22-25, 1958

STOODY COMPANY

11930 East Slauson Avenue, Whittier, California



Lima Type 2400 6-cu. yd. shovel at work loading ore in Venezuela iron mine.

THE LIMA TYPE 2400... muscled for the big mining jobs

Quality does pay off. As hundreds of mining operators have found, Lima's extra engineering features and precision construction mean greater tonnages, higher profits.

When the going is tough, there is no substitute for these Lima Type 2400 quality features:

Crawlers are wide and long for generous ground contact and ease of handling.

Tread rollers have specially hardened rims to resist wear . . . have dirt seal rings and retainers.

Drums are extra wide, with large diameters . . . advantageous when operating as a dragline, crane or high-lift shovel, because of greater cable capacity.

Anti-friction bearings at all important bearing points, including the drums.

Extra-large air-operated clutches respond instantly to the slightest movement of the controls, reducing operator fatigue.

Torque converter increases output, reduces shock loading, prevents engine stall . . . cushioned effect of drive lengthens cable life, lowers machinery maintenance. Standard on Type 2400.

All gears, smaller parts and shafts that are subjected to extra wear are flame or induction hardened for longer life.

There is a Lima for every kind of mining operation. Shovels ½ to 6 cu. yds., cranes to 110 tons and draglines variable. Get full details on these powered-for-profit machines from your nearby Lima distributor, or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Lima Type 604 1½-cu. yd. shovel and Lima Type 1201 3-cu. yd. shovel loading iron ore on Mesabi Iron Range.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

BALDWIN BLH LIMA-HAMILTON

5818

KW-DART 35SL 35 TON PAYLOAD

KW-DART 50T—50 TON PAYLOAD

YES, Step up into the KW-DART 35SL and "Step up" your production with a faster 35 Ton Payload cycle—and on only two axles.

WRITE FOR SPECIFICATIONS TODAY

POWER for the Climb...
SPEED for the Haul Road

Heavy Duty Trucks Exclusively Since **1903**

10 TO 50 TON PAYLOADS

See us at the Mining Show! Spaces 810-811

KW-DART

Kansas City 8, Missouri

D-142

IN AFRICA

Two mines in Uganda, Kilembe and Mealder-Nyanza, have been granted concessions on freight rates by East African Railways for copper and copper ore. The rate for concentrates has been cut by 15% and for blister by 13%. The concessions will be subject to revision when the world copper price improves.

Prospects of the economic development of iron ore deposits in Swaziland have had a sharp setback. A company involving Anglo-American and the British firm of Guest, Keen and Nettlefold has carried out some exploratory work on the deposits, estimated at some 30-million tons of high-grade ore with a possible reserve of another 30-million tons.

But the hopeful picture has changed with the sharp decline in the world price of ore and the fall in freight rates.

Core samples at Berg Aukas in South-West Africa have indicated at least 500,000 tons of lead vanadate between the surface and a depth of 600 ft in two lenses. This information was released by the company concerned in the operations—the S.W.A. Co. It is not possible to say at this stage, however, whether profitable operations can be established on a substantial scale.

Value of mineral production in Southern Rhodesia during the first four months of this year was $24,606,604, 8½% more than in the first four months of 1957. Asbestos production, which was valued at $8,564,892 in the first four months of this year, was up 6½% over last year's figure. Chrome—$4,278,198.4—up 21%, and gold at $1,567,502 was 1% higher.

The only reduction was in the value of coal—$3,228,164.8—10% less than the first four months of last year.

The government mines department said that it expected this year's mineral production in Southern Rhodesia to be a new record.

South African mineral production for the first four months of this year showed an increase in value for nearly all the main products as compared with the same period last year.

Asbestos was up by $1,376,034, iron ore by nearly $196,000, and manganese by $904,400.

Chrome and tin recorded a slight fall. Copper, reflecting the drop in export prices, fell off in value from about $10,099,600 to just below $8,400,000.

The Southern Rhodesian Mines and Minerals Amendment Act, 1958, which provides for the control of mining for precious stones and for the establishment of a Precious Stones Board which will generally control the sale of precious stones, has now come into operation. The extent and value of the emerald deposit at Belingwe, in the territory, is still undetermined. A portion of the 500-square-mile area surrounding the deposits has, however, been opened to prospectors.

Amcor (African Metals Corp.) has acquired options on chrome claims in the Matago fields in the Belingwe Reserve, Northern Rhodesia. Exploratory work is in progress.

The value of minerals produced in Northern Rhodesia in April showed a decrease of $5.6-million over the value of output in April last year. Mineral production in April last year amounted to $23,640,400. The drop is accounted for almost entirely by the fall in the world price of copper. Mineral production in Northern Rhodesia for the first four months of this year amounted to $76,580,630.

Development results at the Virginia gold mine (O.F.S.) during the first five months of this year are, according to the company, lower than in the corresponding period of last year.

Of the 30,000 ft sampled between January and May, 36.3% was payable, compared with 49% in 1957.

The gold output for May declared by the Transvaal and Free State Chamber of Mines, at 1,472,454 oz, is the second highest so far achieved by the industry. It is about 7,000 oz less than the record produced last July.

Agreement in principle has been reached with the South African Government for De Beers to start extensive prospecting for diamonds on the company's proper-

BUILT TO SUIT!

1½ Ton Type J

ATLAS builds storage battery locomotives to suit "actual" conditions of your operation . . . still using standard, field-proven parts. Ask for a quote on a "special" design and be surprised how easily and economically you can get a machine built to "suit" your needs.

3 to 3½ Ton Type Q

3 Ton Type K

IN CANADA
MINE EQUIPMENT CO.
Montreal 28, Quebec
Toronto • Sudbury • Kirkland Lake
Edmonton • Vancouver

4 to 6 Ton Type A

THE ATLAS CAR & MFG. CO.
1140 IVANHOE ROAD • CLEVELAND 10, OHIO

CONTRACT CORE DRILLING

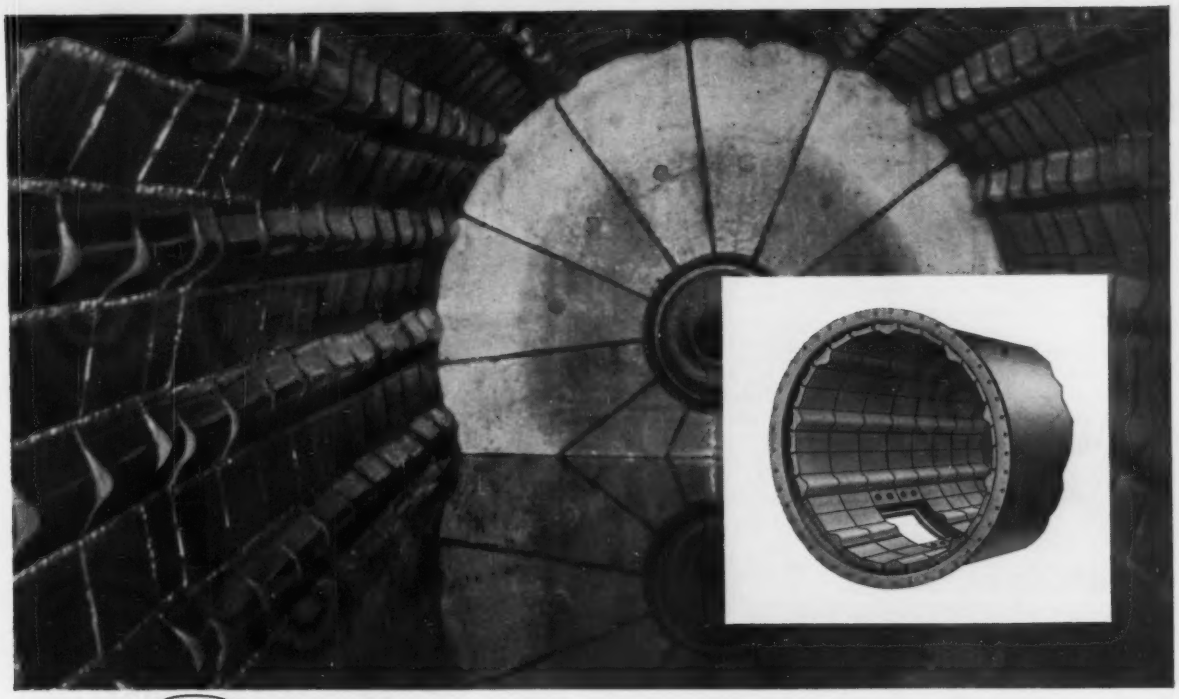
EXPLORATION FOR MINERAL DEPOSITS
INCLUDING URANIUM & LIMESTONE — ANYWHERE

FOUNDATION TEST BORING • GROUT HOLE DRILLING

Skilled crews and complete stock of core drills and accessory equipment maintained at all times

Core Drill Contractors for more than 60 years

JOY MANUFACTURING CO.
Contract Core Drill Division
MICHIGAN CITY, INDIANA



8 Reasons Why You Should Standardize with B&W Universal Liner Plates

Better Performance with Lower Costs— Same Casting Fits All Mill Sizes

B&W Tube Mill Liners reduce capital, time and labor costs. Consequently, they reduce the cost of the material ground. Here are eight reasons why:

1. Lower Initial Costs—standardization eliminates chiller and pattern costs.
2. Longer Life For Liners—better quality control on a mass production casting, utilizing permanent molds, results in uniform wear. Ideal size for uniform chill and heat-treatment.
3. Longer Life for Different Applications—this is assured by selection of proper materials. Design is suitable for either chilled irons or wear steels.
4. Reduced Costs in Both Direct Labor and Outage —installation time is less because small size and weight of castings allows them to be handled easily, without cranes and with less fatigue for workers.
5. Reduces Costs in Storage Space—because small castings stack easily, little storage space is required. One design of casting interchangeable for all size mills also simplifies records.
6. Reduced Costs in Liner Inventory—standardization is possible because one design fits all diameters of mills. Standardization means quicker unloading and storage.
7. Reduced Costs on Breakage Claims and Delays for Replacements—small castings are rugged and almost impossible to break by handling. Large castings of hard, brittle irons sometimes break in shipment.
8. Reduced Costs in Determining Most Efficient Wear Patterns—you can get wear profiles consisting of all lifter ribs or all flats from the same castings, as well as a combination of both including straight or spiralled lifter pattern.

Liners are supplied in two nominal thicknesses, 1½" and 3" with 1½" high lifters. Castings are 6" wide x 12" long. Positive seating of small castings on mill shell means less breakage of castings under operating conditions. For additional information on B&W Universal Tube Mill Liner Plates write The Babcock & Wilcox Company, Process Equipment, Barberton, Ohio.

S-471

BABCOCK & WILCOX

BOILER DIVISION

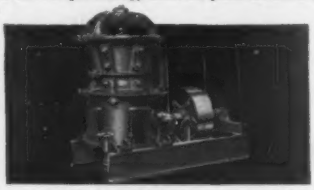
NO MAJOR REPAIRS IN 25 YEARS*

Sturtevant Construction Assures Long Mill Life at Top Loads

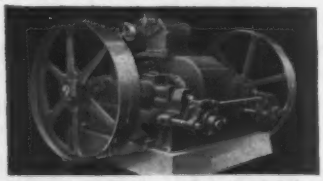
Sturtevant crushing and grinding machinery answers the long life top-load production problem for medium to small size plants. Many Sturtevants have been operating above rated capacities for more than 25 years, and *without a major repair.*

"Open-Door" design gives instant accessibility where needed — makes cleanouts, inspection and maintenance fast and easy. Machines may be set up in units to operate at equal quality and capacity.

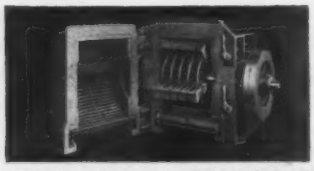
Jaw Crushers — Produce coarse (5 in. largest model) to fine (¼ in. smallest model). Eight models range from 2 x 6 in. jaw opening (lab model) to 12 x 26 in. Capacities to 30 tph. All except two smallest sizes operate on double cam principle — crush double per energy unit. *Request Bulletin No. 062.*



Rotary Fine Crusher — Reduce soft to medium hard 3 to 8 in. material down to ¼ to 1¼ in. sizes. Capacities up to 30 tph. Smallest model has 6 x 18 in. hopper opening; largest, 10 x 30 in. Non-clogging operation. Single handwheel regulates size. *Request Bulletin No. 063.*



Crushing Rolls — Reduce soft to hard 2 in. and smaller materials to from 12 to 20 mesh with minimum fines. Eight sizes, with rolls from 8 x 5 in. to 38 x 20 in.; rates to 87 tph. Three types — Balanced Rolls; Plain Balanced Rolls; Laboratory Rolls — all may be adjusted in operation. *Request Bulletin No. 065.*



Hammer Mills — Reduce to 20 mesh. Swing-Sledge Mills crush or shred medium hard material up to 70 tph. Hinged-Hammer Pulverizers crush or shred softer material at rates up to 30 tph. Four Swing-Sledge Mills with feed openings from 6 x 5 in. to 20 x 30½ in. Four Hinged-Hammer Pulverizers with feed openings from 12 x 12 in. to 12½ x 24 in. *Request Bulletin No. 084.*

**Reports Manager W. Carleton Merrill concerning Sturtevant Swing-Sledge Mill at James F. Morse Co., Boston.*

STURTEVANT MILL COMPANY

101 Clayton St., Boston 22, Mass.

Africa *(Continued)*

ties in Namaqualand and Van Rhynsdorp on the west coast of the Union. The discovery of new payable deposits, said Harry Oppenheimer, chairman of De Beers, is very important if the Union is to remain the world's leading diamond producer.

The First Electric Corporation of S. A., Ltd., has built 31 pumps for Anglo-Transvaal's mines at Virginia.

Of the total, 15 were delivered to the Merriespruit mine, flooded last year. The other 16 were ordered for the Virginia mine. An estimated 8-million gpd are being pumped out of the Virginia.

President Abdul Nasser of the United Arab Republic has ordered that all permits and concession agreements for prospecting and developing hydrocarbon and other mineral resources in Syria could now be granted only by decrees signed by him.

The Kansanshi Copper Mine in northern Rhodesia has nearly licked its problem of maximum copper recovery from the different ores it mines.

A six-month research program has produced methods for the recovery of 90% of the copper, according to consulting engineers of the Anglo American Corp., South Africa. The ore is treated in a mixture of concentrates from sulphur and oxide ore balanced to known reserve grades and tonnages.

"Underground Specialists"

Shafts - Tunnels

Petroleum Products Storage

Engineers

Contractors

SHAFT CONSTRUCTORS, Inc.

P. O. Box 7695, Denver 15, Colo.

Phone BElmont 7-0403

NEW FOR YOUR CONVENIENCE...

FLEXCO "25-PAK"

TWENTY-FIVE COMPLETE SETS OF FLEXCO HD BELT FASTENERS NOW AVAILABLE IN ONE EASY-TO-HANDLE ECONOMY BULK PACKAGE

There's no need now to carry several 10-set boxes to the job—every "25-PAK" contains 25 complete sets of FLEXCO Fasteners (bottom plates, top plates, clips, nuts and bolts) . . . enough FLEXCO Fasteners to join common belt widths (for example: one "25-PAK" box, size 1½E, will join a 36" belt.) Our savings from bulk-packaging are passed on to you!

Label on each "25-PAK" box has chart indicating the number of FLEXCO HD Fasteners to use for given belt widths.

Standard shipping carton contains four "25-PAK" boxes of one size fastener. Keep a supply of "25-PAKS" on hand. Easy to store and inventory, sturdy boxes and shipping cartons have many uses.

Ask your FLEXCO distributor or write to us for additional information.

Flexible **STEEL LACING COMPANY**

4635 LEXINGTON ST. • CHICAGO 44, ILL.

FOR THE SPLICE OF A LIFETIME

USS "T-1" Steel cut the cost of truck body liner plates by 75% because of its high resistance to impact abrasion.

Liner plates made of USS "T-1" Steel after a year's service. Note the excellent condition. Estimated life has been doubled.

How to double the life of equipment subject to impact abrasion

Hard chunks of copper ore falling into these trucks used to chew up the body liners in a hurry. And dumping a 41-ton load in 10 seconds caused terrific abrasion. The old liners wore out at a highly uneconomical rate and were costly to replace.

After trying a variety of different steels, the owners settled on USS "T-1" Steel furnished to 321 min. Brinell hardness. The bottom liner plates were 1 inch thick and the side plates were ¼ inch. These plates have been taking a pounding for almost two years. None have worn out —and it is estimated that they will last more than twice as long as the *best* previously used plates. Costs of liner plates were reduced by 75%.

Other cost-saving uses. USS "T-1" Constructional Alloy Steel is being used for shovel dippers, chute liners, ore cars, skip hoist buckets, trailer frames—wherever an extra strong, weldable steel is needed. It can be furnished either to 100,000 psi min. yield strength or 321 min. Brinell hardness, so investigate USS "T-1" Steel for your next job. Deliveries are immediate. Ask too about USS High-Strength Low-Alloy Steels which have quite a history of adding life and brawn to heavy-duty equipment. United States Steel Corporation, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa.

USS and "T-1" are registered trademarks

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Supply – Steel Service Centers
United States Steel Export Company

USS United States Steel

VALVES DeZURIK

give you more

at lower cost!

EASY OPERATION

DeZurik Valves open and close EASILY because the plug touches the valve body only when the valve is closed. Pivoting the plug eccentrically means no binding, no scraping, no scoring.

TIGHT SHUT-OFF

The resilient facing on the plug of a DeZurik Valve closes DEAD TIGHT — in spite of solids in the flow! Even when the flow is abrasive, DeZurik Valves close tight!

WITH ECCENTRIC ACTION

NO MAINTENANCE

Because of their eccentric action and resilient-faced plugs, DeZurik Valves need no lubrication to provide easy operation and deliver tight shut-off. No guns or greases to stock, no lube schedule to maintain.

RUBBER-LINED

DeZurik Valves are available in rubber-lined models for the ultimate in resistance to abrasion and corrosion. Every metal part of the valve, including the flanges, that comes in contact with the flow is protected.

DeZurik Valves are available in a complete range of materials, in sizes from ½" thru 20", and with a full selection of remote operators. See the DeZurik representative in your area or write to

DeZURIK CORPORATION
SARTELL, MINNESOTA

GRAVITY SEPARATION

NEW UNIQUE!

SEE IT in operation at Booth 1340 AMC Mining Show San Francisco

The T & R CLASSIFIER-CONCENTRATOR

BUSH

ENGINEERING & MANUFACTURING

1 Lester Court
Salt Lake City
Utah

In most mining companies, all key officials read E&MJ because it helps them do a better job

If you're not a regular subscriber, Mail this coupon TODAY

ENGINEERING AND MINING JOURNAL,
Subscription Manager,
330 West 42nd St., New York 36, N. Y.

Send me E&MJ for 1 year at applicable rate below.

☐ Check enclosed ☐ Bill Company ☐ Bill me

Name _____ Position _____

Mailing Address: ☐ Home ☐ Business

_____

_____

City _____ Zone _____ State _____

Mining Company _____

Mineral (s) Mined _____

SUBSCRIPTION RATES (1 year): U. S. and possessions, $4; Canada, $5; Latin America and Phillipine Islands, $8; Elsewhere, $15.

To Save Delay, Please Fill Out Completely

J-8-58

Macks take up where other trucks leave off

And there's a dependable Mack for your every important hauling job!

Got big, rugged, truck-pounding off-highway jobs that demand the utmost in year-in, year-out truck stamina? They're made to order for the Mack L series . . . big, powerful units that range from 15 tonners up to the very largest.

Got on-and-off highway routes that demand clockwork dependability and cost-busting economy? From the 40,000-lb. GVW B-40 up to the 80,000-lb. GVW B-80's, Mack fields the units that have proved superior on every operation where profits ride on truck performance.

Need engines—gas- or Diesel-powered—transmissions, clutches, frames, suspensions, bogies and cabs that stand up to fast-moving shovels, rutted roads and slippery going? Mack makes them to the highest standards in the industry and assembles them in units engineered to your most exacting requirements.

Find out for yourself—soon—why many seasoned mine operators say that *two* Macks, properly used, can outwork, outlast and outearn *three* or more competitive units of equal capacity on tough jobs. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd., Toronto, Ont.

Be Our Guest at the Mining Show. See this 22½-ton LVX with rock body. See the new B-8136SX Mack Thermodyne® Diesel unit with six-wheel drive for on-and-off highway service where the going's next to impossible.

MACK

first name for

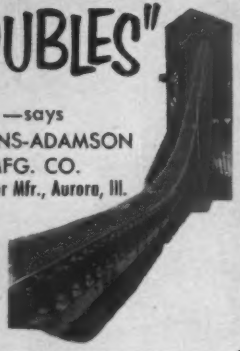
TRUCKS

IT'S PART OF THE LANGUAGE . . . BUILT LIKE A MACK

8342

"NO MORE LUBRICATION TROUBLES"

—says STEPHENS-ADAMSON MFG. CO.
Conveyor Mfr., Aurora, Ill.



"LUBRIPLATE Lubricants satisfy the 'one-shot' requirements of our conveyor idlers. LUBRIPLATE effectively lubricates each bearing in turn and flows through the hollow shaft to the next bearing. We do not know of a single case of bearing trouble through faulty lubrication where LUBRIPLATE has been used."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

IN LATIN AMERICA

COLOMBIA

A rich deposit of magnesium ore has been discovered near the city of Cali, in the Valle del Cauca Department.

The Medellin School of Mines and the University of Valle claimed that the deposit's magnesium content was high—about 80%—and that orebody was large enough for profitable mining.

ARGENTINA

Argentine mineral exports during the first five months of 1958 rose more than 30% in value and almost 20% in volume over totals for last year's corresponding period.

In making the announcement, the National Mining Direction (Direccion Nacional de Geologia y Mineria) released figures to show that 24,255 metric tons of minerals were exported from January to May this year, an increase of nearly 4,000 tons over the 1957 record.

CHILE

During the recent strike at Chuquicamata, 37,500 short tons of copper production were lost. The company expects, however, to be able to make up at least 80% of the loss during the rest of this year.

Empresa Nacional de Fundiciones will build a copper smelter at the port of Quintero and will soon start construction of a 12,000-volt transmission line from Quintero to Illapel in the southern part of Coquimbo Province. Initial capacity of the new smelter will be 25,000 metric tons of blister per year.

The mechanical loading wharf at Caldera (joint project of Compania Minera Santa Fe and Cerro Iman) will be ready for use by November. The $1.5-million wharf will serve the entire Copiapo mining district.

IN THE PHILIPPINES

In May, Atlas Consolidated had the second highest copper production rate of any month since the company's Toledo mine began operating three years ago. In 27 days, 307,833 tons were milled, averaging 0.7% copper, producing 7404 tons of concentrates containing 3,900,730 lb of copper and 947 oz gold.

Marinduque Iron Mine's May output from its Marinduque property was 6,412 tons of iron ore. In addition, 2,871 tons of copper concentrates containing 1,714,796 lb of copper were produced at its Sipalay mine, and 4,137 tons of copper

Announcement #2 to all our mining friends

We are almost ready!

Last month we announced, "We are expecting" in the Cryderman family.

We plan to name her "BETSY" and we hope to show her first to our many friends at the Rocky Mtn. Minerals Conference, Salt Lake City, Utah, September 17-19, 1958.

Possibly we'll be able to show you a picture of BETSY in the next E. & M. J. Watch our strides and progress in mechanization.

Let us have all your shaft sinking problems.

SHAFT AND DEVELOPMENT MACHINES, INC.
808 Newhouse Building, Salt Lake City, Utah
Empire 3-5373

Complete Line Of

DREDGES and DREDGING EQUIPMENT FOR MINING

- *Hydraulic*
- *Bucket Line (Placer)*
- *Dipper*
- *Grapple*

Plus detailed engineering service . . . write for full information.

ELLICOTT MACHINE CORPORATION
1633 Bush Street, Baltimore 30, Md.
525 Market Street, San Francisco 5, Calif.

Subsidiaries: Dragues Ellicott France, Paris, France; Ellicott de Mexico, Mexico City, Mex.; Ellicott Fabricators, Inc., Baltimore, Md.; McConway & Torley Corp., Pittsburgh, Pa.; Baltimore Foundry & Machine Corp., Baltimore, Md.

Successors to the floating dredge business of the Bucyrus-Erie Co. and the American Steel Dredge Co. Complete engineering sales and repair parts service. 1146

• Hosing off Permutit SKB resin beads in baskets of R.I.P. bank at Edgemont, South Dakota mill of Mines Development, Inc.

Edgemont R.I.P. mill loads 4 lb. of U_3O_8 per cu. ft. of Permutit SKB resin!

• Here's how low-slime pulp and Permutit SKB ion-exchange resins are producing at Mines Development's efficient mill: a loading of 4.0 lb. of uranium oxide per cu. ft. of resin, a concentration of 10 to 12 grams of uranium oxide per liter of eluate, and an R.I.P. uranium recovery of 99.7 per cent with a minimum of iron, vanadium and aluminum impurities.

It's proof of Permutit SKB resin's high uranium capacity and recovery ratio under actual production conditions. It explains why a number of R.I.P. mills have switched to this unique resin.

Permutit SKB was developed especially for R.I.P. uranium extraction. It disperses well, preventing "blinding" of the baskets and improving resin-pulp contact. Its unique chemical structure gives it fast loading for high recovery, high capacity and fast elution. This results in extremely high concentrations of recovered uranium, particularly in nitrate elution systems. It also means low precipitation costs and a high purity uranium.

Permutit SK (finer mesh than SKB) offers the same chemical advantages when used for uranium extraction in ion-exchange columns.

We'll supply full details and samples to help you evaluate Permutit SK, SKB or other ion exchange resins. Write: The Permutit Company, Dept. EM-8, 50 West 44th Street, New York 36, N.Y. or The Permutit Company of Canada, Ltd., Toronto 1, Ontario.

PERMUTIT®

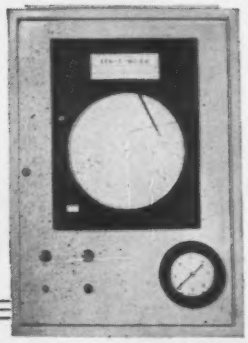
rhymes with "compute it"

a division of PFAUDLER PERMUTIT INC.

ION EXCHANGE for Water Conditioning
Chemical Processing • Industrial Water Treatment

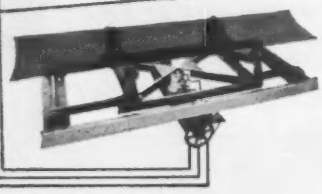
CON-O-WEIGH

the complete control system...



for conveyor belt

FEEDING
BLENDING
PROPORTIONING



CON-O-WEIGH is a highly accurate continuous belt scale for weighing free-flowing bulk materials. It is engineered as a complete control system for many of industry's most technical feeding, weighing, blending and totalizing operations. CON-O-WEIGH is also widely used for simple weighing and recording routines on a tons-per-hour basis.

For your specific bulk material weighing problem get the facts on this rugged, easy to install machine.

Write for free bulletin 57-A

INDUSTRIAL PHYSICS and ELECTRONICS CO.

470 So. 10th East Phone DA 8-8678
Salt Lake City, Utah

Specialists in instrumentation, control and automation for milling and smelting. Consulting, engineering, design and installation services for all types of system controls.

Philippines *(Continued)*

concentrates containing 1,203,470 lb of copper from its Samar mine at Bagacay. Total value of all production exceeded $790,000.

May production at Lepanto Consolidated in northern Luzon was 4,002 tons of concentrates from 39,137 tons of ore milled. Copper content was estimated at 2,389,650 lb of copper and 3,751 oz gold. Average copper content was 3.2% and gold content 0.13 oz per ton.

Increased production of quicksilver has been reported from the Palawan Quicksilver Mines operated by Marsman & Co. Yield in May was 300 flasks valued at $66,700. The company has constructed a third kiln for ore treatment.

IN AUSTRALIA

Australian producers report that there is almost no demand for rutile. Aside from previously negotiated long-term contracts, the only market appears to be in the welding rod industry.

King Island Scheelite Ltd. is closing down because of low tungsten prices. It is being placed on a "stand-by" basis to enable quick resumption of operations if and when warranted.

Senator Spooner, Minister for National Development, recently said that the sale of Australia's uranium production was assured by long-term contracts and an expansion of Rum Jungle field was contemplated despite the easing world demand.

Westralian Oil Ltd. expects to begin production at Yoganup, Western Australia, in November of this year. Pilot plant is already in operation and, because of the high quality of its ilmenite, the company expects no marketing difficulties.

Wellington Alluvials Ltd. is going into voluntary liquidation because advance boring showed significant reductions in both over-all grade and reserve yardage. In addition to gold, this company was also selling some industrial diamonds. New Guinea Gold & Petroleum Development N.L. will increase output from its gold mine at Edie Creek, near Wau.

Union Carbide Corp. has obtained options over extensive manganese deposits in an area south-east of Nullagine, Western Australia. These are not far from areas where manganese is at present being mined and carted to Port Hedland for export.

Union Carbide is understood to be preparing a big program of mapping, drilling and sampling and hopes to develop an extensive deposit of manganese ore. It will also study the economics of mining in the light of transportation problems.

A record volume of asbestos will be produced in Australia during 1958 and on present indications Australian exports should well exceed those for 1957.

The 1957 production was a record of

it's easy on

ABC NEOLON®

flexible ventilating tubing

- Made from neoprene coated nylon — convenient lengths and diameters.
- Tough as an auto tire—almost impossible to tear — hard to puncture—abrasion resistant.
- Lightweight — easy to carry — easy to install — easy to store. Easy to couple.
- Readily follows contour of mine wall.
- No denting, corroding and installation troubles as with metallic pipe.

Also WIRE REINFORCED NEOLON TUBING for pulling out fouled air!

SEND FOR CATALOG 58.

AMERICAN BRATTICE CLOTH CORP.

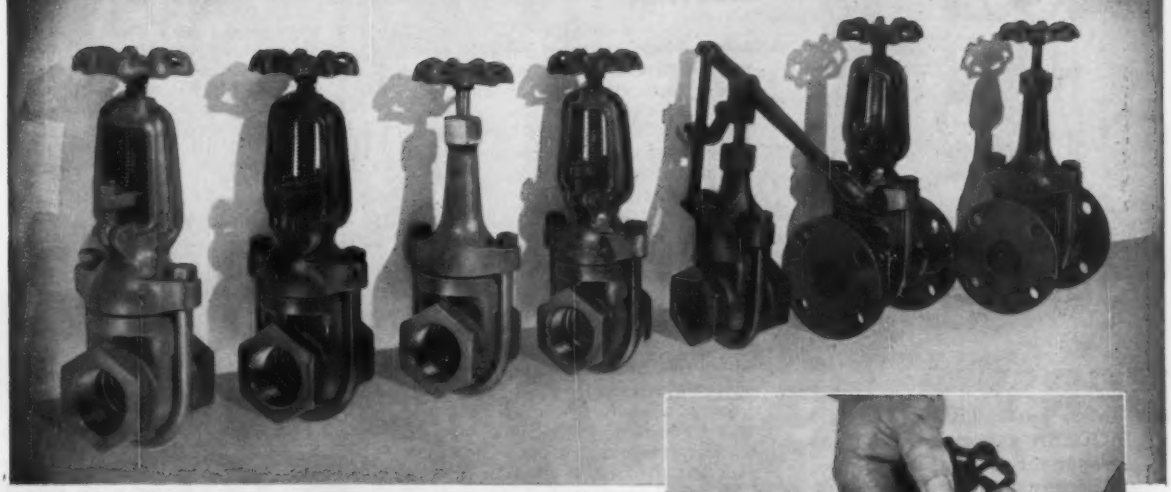
220 S. Buffalo St., Warsaw, Indiana

Eleven lines of WALWORTH Saddle Type Wedge Gate Valves

Bronze-Mounted — All-Iron — Ni-Resist

Outside Screw and Yoke — Non-Rising Stem — Quick Opening

Flanged Ends — Screwed Ends



Walworth saddle-type wedge gate valves are manufactured in eleven different combinations of designs and materials, seven of which are illustrated above.

Saddle type wedge gate valves are easy to take apart and are particularly suitable for lines requiring frequent cleaning. Walworth Saddle-Type Wedge Gate Valves are available in a variety of designs including OS & Y; Inside Screw Rising Stem, and Sliding Stem Quick Opening types—in Bronze-Mounted, All-Iron, and Ni-Resist. All types are designed to permit repacking under pressure in either the open or closed position.

FOR COMPLETE INFORMATION, See your local Walworth Distributor or write on business stationery for illustrated circular.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

WALWORTH

60 East 42nd Street, New York 17, New York

SUBSIDIARIES: ALLOY STEEL PRODUCTS CO. · CONOFLOW CORPORATION · GROVE VALVE & REGULATOR CO. · SOUTHWEST FABRICATING & WELDING CO., INC. · M & H VALVE & FITTINGS CO. · WALWORTH COMPANY OF CANADA, LTD.

You're Not Behind
The Times
IF You're Behind a
KERN
INSTRUMENT

Obsolete surveying tools are time-consuming, wasteful ... out of step with modern construction equipment used on your jobs.

KERN THE MOST MODERN surveying instruments available. Down-to-fundamentals, functional design ... maximum operational efficiency and portability ... reliable precision results.

KNOWN THE WORLD OVER
for accuracy, speed, reliability, economy.

- Minimum set-up time
- Fast, effortless, simple operation
- Readings at a glance
- Exceptional clarity and contrast of image

★

For Full Information Write for Brochure V 554-7

PROMPT, RELIABLE SERVICE
FACTORY TRAINED PERSONNEL

Kern and Only Kern
Offers You
The Latest Designs of
Dr. Henry Wild

Kern SWISS
The FINEST in SURVEYING EQUIPMENT
KERN INSTRUMENTS INC.
120 Grand St., White Plains, N. Y

Australia *(Continued)*

13,098 long tons comprising 11,104 long tons of crocidolite and 1,994 tons of chrysotile. During the year, 10,264 tons of crocidolite and 363 tons of chrysotile were exported.

Australia continued to be a large importer of asbestos with imports of 32,599 long tons of which chrysotile and amosite accounted for 22,016 and 9,887 long tons, respectively.

IN EUROPE

AUSTRIA

Iron ore deposits (about 4-million metric tons) have been found in Styria province's Huettenberg area by the Oesterreichische Alpine Montan A. G. According to director general Dr. H. Oberegger, the ore has a high Fe content and the company plans to mine it at a rate of 200,000 tons per year.

BULGARIA

Soviet geologists have reportedly uncovered rich uranium deposits in Bulgaria. In Silven, the strike was said to be "so rich and extensive that the whole area had been cordoned off."

Large deposits of cobalt have also been discovered and the Russians are reported planning to send men and materials to open it up.

DENMARK

The Danish Atomic Research Institute near Copenhagen is investigating ore mined in Greenland to determine its uranium content. The Danish scientists will soon move their headquarters to Greenland to determine whether it will be worthwhile building a full-scale uranium processing plant near the deposits.

ITALY

A bill for the appropriation of $2-million to boost mineral prospecting in Sicily has been approved by the Sicilian regional assembly. The money will serve to complete prospecting programs presently being developed and to finance a plan for the exploration of radioactive minerals.

ENGLAND

Exploratory drilling and the re-examination of abandoned mine workings are part of a hunt for uranium now going on in southwestern England.

The Department of Scientific and Industrial Research plans to increase its exploratory drillings and then to expand its surveys to Wales, Northern England and Scotland.

The SCHOOL That Comes To YOU

- If you are on foreign assignment
- If you live in an isolated area

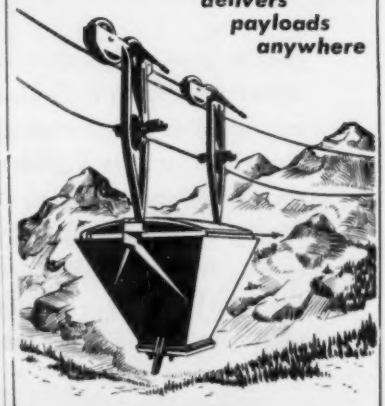
Wherever you are, Calvert SCHOOL-AT-HOME Courses can provide, by mail, a modern education for your child. Kindergarten through 8th grade. Courses stress the three R's, science, and cultural subjects. They are kept up to date by continuous pretesting in Calvert's famous laboratory-school in Baltimore. Parents with no teaching experience are supplied with complete step-by-step instructions. Start any time, transfer easily to American schools. More than 100,000 children all over the world have used Calvert Courses. 53rd year. Non-profit. Catalog (give age, grade).

960 Tuscany Road, Baltimore 10, Md.

CALVERT SCHOOL

RIBLET

delivers payloads anywhere



RISE ABOVE TRANSPORTATION OBSTACLES

S'nce 1897 Riblet has been meeting and defeating transportation obstacles both climatic and topographic. The unique features possessed only by these custom designed aerial tramways make them highly efficient transportation systems for level application as well as otherwise inaccessible districts. Write for illustrated brochure.

RIBLET TRAMWAY COMPANY
Box 7, Station A, Spokane, Wash.

deeper frame...

longer swing jaw...

greater reduction!

• And the BIRDSBORO-BUCHANAN Primary Jaw Crusher has reversible jaw plates, saving you 50% on replacement costs. Offset toe lugs, a patented feature, help give you additional savings, often doubling jaw plate life. The Deep-Frame design helps improve your production in several ways. It assures positive nipping action; minimizes slippage; and gives a higher rate of reduction. The longer swing jaw gives you faster crushing to smaller sizes. Like to hear more about its field performance? Your Birdsboro representative has facts and figures. *Main Office, Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

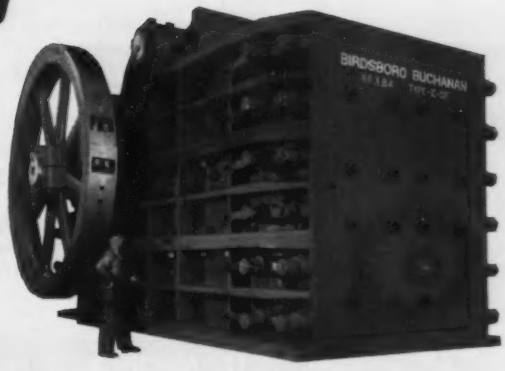
World-Wide Agent Representation. Contact home office for nearest representative.

Canadian Representative & Manufacturer: John Inglis Co., Ltd., Toronto, Canada.

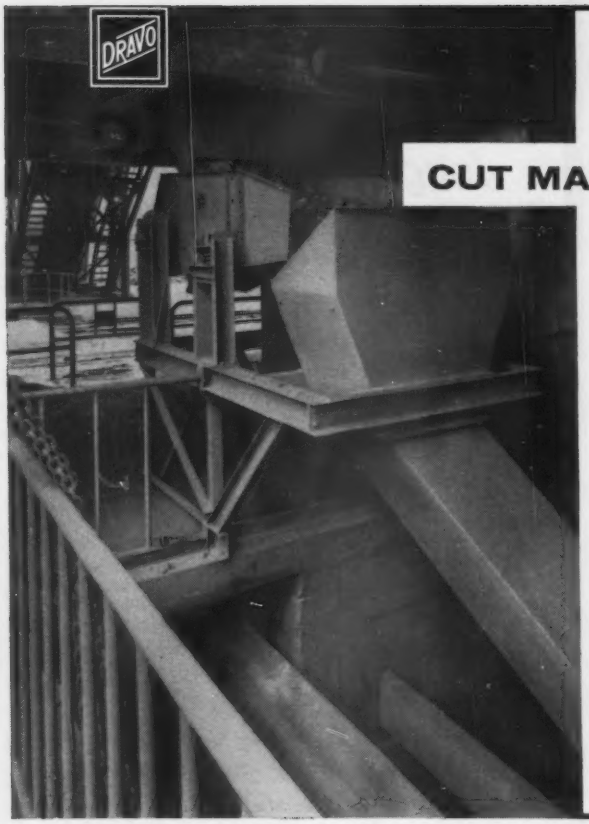
BIRDSBORO

STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel



Available in sizes ranging from 24" x 36" to 66" x 84"



Dravo-Schenck Vibro-Feeders CUT MATERIALS HANDLING COSTS

Because it is built to stand up under the kind of punishment that hot, abrasive or other hard-to-handle materials deal out, Dravo-Schenck vibro equipment keeps maintenance costs way down. All wearing parts are ruggedly constructed, and the unique "Micro-Thrust" exciter unit helps reduce wear by moving material with minimum contact with troughs or screens.

Cost-cutting, heavy-duty Dravo-Schenck screens, conveyors and feeders are at work in a wide variety of applications—handling such difficult materials as ferrous and non-ferrous ores, sinter, cement clinker, crushed stone, chemicals and coal.

Our engineers will gladly work with you on specific problems. For information, write for Bulletin No. 1475, Dravo Corporation, Pittsburgh 22, Penna.

DRAVO
CORPORATION

Freely oscillating vibro-feeder, 3 x 7 ft, for 200 tph of iron ore. This type of heavy-duty feeder is available with capacities in excess of 800 tph.

ALLUVIAL DEPOSITS

Gold-Tin-Columbite-Ilmenite-Bauxite Rare Earths

Most accurately and economically tested for . . . with the

EMPIRE DRILL

NEW YORK ENGINEERING COMPANY

75 West St., N. Y. City, U.S.A. Cable Address NYECO, N.Y.

Specialists in Wet Gravity Ore Recovery, Sizing and Separating Equipment since 1912

ORE CONCENTRATING TABLES
•
REVOLVING FEED DISTRIBUTORS
•
HYDRAULIC CLASSIFIERS
•
VIBRATING SCREENS

DEISTER

DEISTER MACHINE CO., Fort Wayne 4, Indiana

Europe *(Continued)*

IRELAND

Ireland's largest copper mining company, St. Patrick's at Avoca in County Wicklow (subsidiary of the Mogul Mining Corp., Toronto), will start producing in early autumn.

It is reported that Avoca's estimated ore reserve totals 20-million tons, with an average copper grade of 1.11%.

POLAND

Poland's Czestochova iron ore basin, with a reserve reportedly capable of lasting for another 50 years, will double its annual output by 1968. This is in line with a program to keep imports at the lowest possible level. At present, siderite-type deposit is being mined at an annual rate of 1.5-million metric tons.

Poland's 1957 industrial production value was 9.6% above the 1956 level, and in most of the basic commodities, the country plans a production increase in the next few years. Copper ore—1957 figure was 1.25-million metric tons; 1960 figure will be 2.05-million metric tons. Zinc—1957 figure was 159,000 metric tons; 1960 will be 175,000 metric tons. Aluminum—1957 figure was 20,000 metric tons; 1960 will be 23,000 metric tons.

0.5 seconds

1.0 seconds

1.5 seconds

The little puff of smoke in the foreground is a signal bomb for the photographer

2.0 seconds

3.5 seconds

7.0 seconds

2,750,000 pounds of Du Pont "Nitramex®" 2H Removes Ripple Rock

Why it was chosen for this biggest of all blasts...

For Its Safety—The inherent safety of blasting agents helped win the nod for "Nitramex" 2H over conventional dynamites for a complex coyote blast of this sort.

For Handling Convenience and Water Resistance—Packed in hermetically sealed metal containers easily carried and stacked, and producing no headache from handling, "Nitramex" 2H was a natural.

See our color motion picture of Ripple Rock, man's biggest nonatomic blast, at Booth 1210, American Mining Congress 1958 Mining Show, Sept. 22 to 25, San Francisco Civic Auditorium.

For Strength—Plenty of energy was needed to knock off two underwater peaks, and "Nitramex" 2H supplies power equal to 80% Gelatin, higher than any other blasting agent.

For High Density—The blast required extremely heavy charges. "Nitramex" 2H, with the highest density of any commercial explosive, insured getting the required loads where they were needed regardless of size of coyote.

For Shattering Power—The high velocity and power of "Nitramex" 2H was needed to insure adequate breakage and dispersal of rock in order to provide required channel depth without dredging.

Your Du Pont Explosives representative can show you a Du Pont Blasting Agent that can improve *your* blasting. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT BLASTING AGENTS

DU PONT

Blasting Supplies and Accessories

Better Things for Better Living . . . *through Chemistry*

ASSAYING
CONSULTING
PROSPECTING
ORE TESTING

PROFESSIONAL SERVICES

RESEARCH
METALLURGY
MILL DESIGN
MINE DEPARTMENT

BAILEY & VAN HORN
Geology and Mining Consultants
Box 7, Murphy, N.C.
Phone VErnon 7-2048

FRANCIS H. FREDERICK
Consulting Mining Geologist
690 Market Street
San Francisco 4, California
Telephone: SUtter 1-1562

LEDOUX & COMPANY, Inc.
Metallurgical Chemists — Assayers
Spectroscopists
Representatives of Shippers of Ores and Metals at Buyers Works
Mine Examination Analyses
359 Alfred Ave., Teaneck, N. J.

O'DONNELL & SCHMIDT
Mining Consultants
165 Broadway New York 6, N.Y.
BArclay 7-6960
Cables: EXAMINES

BEHRE DOLBEAR & COMPANY, INC.
Consultants
Mining Geological and Metallurgical
11 Broadway, New York 4, N. Y.
Cable Address—BERDOL

ABBOT A. HANKS, INC.
Assayers — Chemists
Est. 1866
Spectrographic Analysts
Shippers Representative
624 Sacramento St. San Francisco 11

E. J. LONGYEAR COMPANY
Geological and Mining Consultants
Photogeology
76 So. Eighth St. Minneapolis 2, Minn.
Graybar Bldg.....New York 17, N.Y.
Colorado Bldg.....Denver 2, Colo.
Shoreham Bldg...Washington 5, D.C.
77 York Street.....Toronto, Ontario
129 Ave. De Champs-Elysees Paris, Fr.
Zeekant 35.....The Hague, Holland

PENNSYLVANIA DRILLING COMPANY
Subsurface Explorations Grouting
Industrial Water Supply
Mineral Prospecting
Large Diameter Drilled Shafts
Reports
1205 Chartiers Ave. Pittsburgh 20, Pa.

EDMUND C. BITZER, E. MET.
Mill Design and Operations Consultant
1118 18th Street
Golden, Colorado
Phone CRestview 9-4011

E. LEE HEIDENREICH, JR.
Consulting Engineers
Crushing Plants Quarries
Milling Plants Plant Design
Plant Layouts Appraisals
75 Second St., Newburgh, N. Y.
9 So. Clinton St., Chicago 6, Ill.

Lottridge-Thomas & Associates
Professional Engineers
705 Judge Building
Salt Lake City 11, Utah

AMEDEE A. PEUGNET
Consulting Mining Engineer
Telephone MAin 1-1421
705 Chestnut St., St. Louis 1, Mo.

BLANFORD C. BURGESS
Consulting Engineer
Industrial Mineral Specialist
USOM, APO 928
San Francisco, Calif.
Manila, Philippines Monticello, Ga.

HERON ENGINEERING CO.
Consulting Engineers for all types of Aerial Tramways, Cableways and Suspension Structures.
200 South Acoma St.
Denver 23, Colorado

MERRILL W. MacAFEE
Consulting Engineer
Chemical-Metallurgical-Mining
7668 Santa Fe Ave.
Huntington Park, Calif.
LUdlow 3-1778
FRontier 5-6145

HOWARD G. SCHOENIKE
Consulting Mining Geologist
Examination—Evaluation—Exploration
Metallic and Nonmetallic Minerals
Domestic—Foreign
4039 Turnberry Cir.
Houston, Texas
Tel.: MO 5-7079

ALLEN T. COLE AND ASSOCIATES
Consultants—Industrial Minerals
Exploration, Evaluation
Process Development
2815 Cleveland Heights Boulevard
Lakeland, Florida
MUtual 9-9351 MUtual 3-9033

HOPKINS MINING CONSULTANTS LIMITED
Engineers, Geologists, Geophysicists
Maps and Drafting
Room 102, 33 Melinda Street
Toronto 1, Canada
EMpire 4-5642 EMpire 3-7848
HUdson 9-8375

ROBERT S. MAYO
Civil Engineer
Special Equipment for Concrete Lining of Tunnels and Shafts
Small Koepe Hoists
Sandhog Equipment
Box 1413, Lancaster, Pa.

SMITH-EMERY CO.
Assayers and Chemists
SPECTROGRAPHIC ANALYSES
781 E. Washington Blvd.
Los Angeles 21, Calif.

COWIN & COMPANY, INC.
Mining Engineers & Contractors
Shaft & Slope Sinking
Mine Development
Mine Plant Construction
1—18th Street S. W. Birmingham, Ala.
Phone 56-5566

KELLOGG KREBS
Metallurgical Engineer
Mineral Dressing Consultant
564 Market St., San Francisco 4, Calif.
Telephone: SUtter 1-6613

ARNOLD H. MILLER, INC.
Consulting Engineer
General Mine, Mill and Industrial Appraisals
Plant Design, Mechanization and Improvement
Cable: "ALMIL" Tel. Cortland 7-0635
120 Broadway, New York 5

STILL & STILL
Consulting Mining Engineers and Geologists
24 Union Block—Phone 658
P. O. Box 1512
Prescott, Arizona

DICKINSON LABORATORIES
Assayers — Chemists
Metallurgists — Umpier Work
Ore Shippers representatives at Local Plants
Sampler-Analysts at Mexican Border Points
1300 West Main St. El Paso, Texas

KIRK & COWIN, INC.
Consulting - Reports - Appraisals
1—18th Street SW
Birmingham, Alabama

JOHN D. MORGAN, JR. E.M., PH.D.
Consultant
Business and Defense Problems in Metals, Minerals, and Fuels
1001 Connecticut Ave., N.W.
Wash. 6, D.C.
ME 8-1681

JOHN H. STITZER
Specializing in problems of economics, methods and management for open pit and underground mines.
514 N. Plumer Ave.
Tucson, Ariz.
Phone: EAST 5-5221

EAKLAND & OSTERSTOCK
Consulting Mining Geologists
700 Newhouse Building
Salt Lake City 11, Utah
ELgin 9-6185

LAKEFIELD RESEARCH LIMITED
Metallurgical and Chemical Research
Ore Testing
Analysts and Assaying
Box 430 Phone 7
Lakefield, Ontario, Canada

ARTHUR NOTMAN
Consulting Mining Engineer
55 Liberty St., 18th Floor
New York 5, N. Y., U.S.A.
Telephone BArclay 7-9484

Additional Professional Service Cards on following page

COMPLETE CONSULTING AND MANAGEMENT SERVICES

MINERALS INDUSTRY—WORLD WIDE **SPECIAL SERVICES LATIN AMERICA**

Geological — Mining — Milling — Mechanical — Metallurgical Services — Market Research — Property Appraisals
Diamond Drilling, Mine Development and Production Contracts — Mill and Metallurgical Test Work
Vertical Shaft and Slope Sinking — Newest Equipment — Design and Build Special Mining Equipment — Plants
Process Development — Ventilation Surveys by Expert
Capable Experienced Personnel for all Operations Available

ROGER V. PIERCE AND ASSOCIATES
Registered Engineers

808 Newhouse Building **EMpire 3-5373** **Salt Lake City, Utah**

Professional Services

(Con't from opposite page)

Sprague & Henwood, Inc.
Drilling Service
Foundation Investigation, Test Boring, Grout Hole Drilling and Pressure Grouting Diamond Core Drilling
221 W. Olive St., Scranton, Pa., New York, Phila., Pittsburgh, Atlanta, Ga. Grand Junction, Colorado, Buchans, Newfoundland

H. L. TALBOT
Extraction and Refining of Base Metals
Specializing in Cobalt and Copper
Consulting Metallurgical Engineer
Room 911, 209 Washington St.
Boston 8, Mass.

CONRAD WARD THOMAS
Mining Consulting—
U. S. and Foreign
EXAMINATION — VALUATION
EXPLORATION
DIVERSIFICATION — FINANCING
Bank of the Southwest Building
Houston, Texas
CApitol 7-5855 Cable "GEOCONS"

THOMPSON & LITTON
Consulting
Civil and Mining Engineers
Surveys * Examinations
Appraisals * Design
Telephone Wise 6215
Inn Building, P. O. Box 517
Wise, Virginia

LEO H. TIMMINS, P.Eng.
Examinations—Reports
Financing of Prospects
Suite 700, 1980 Sherbrooke West,
Montreal 25, Quebec, Canada
Phone: GLenview 2376
Cable: TIMCONS

F. C. TORKELSON CO.
Engineers
Industrial Plant Design
Process Development Estimates
Economic Studies Plant Layout
146 South West Temple
Salt Lake City 1, Utah

HARRY J. WOLF
Mining and Consulting Engineer
Examination—Valuations—
Management
One Park Place New York 7, N. Y.
Cable: MINEWOLF
REctor 2-5307

WORLD MINING CONSULTANTS, INC.
Mining Engineers, Geologists
Munsey Bldg., Washington 4, D. C.
220 Broadway, New York 38, N. Y.

REMEMBER! ! !
You can depend on these consultants for a fast accurate solution to your problems. Consult them when necessary.

EMPLOYMENT OPPORTUNITIES

NATIONAL COVERAGE

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant | **Civil Service Opportunities** | **Employment Agencies**
Positions Wanted | **Selling Opportunities Wanted** | **Employment Services**
Part Time Work | **Selling Opportunities Offered** | **Labor Bureaus**

DISPLAYED ——**RATES**—— **UNDISPLAYED**

The advertisement rate is $25.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An Advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.
Subject to Agency Commission.

$1.50 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Box Numbers—counts as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Not subject to Agency Commission.

Send NEW ADS to Class. Adv. Div. ENGINEERING & MINING JOURNAL, P. O. Box 12, N. Y. 36, N. Y.
for September issue closing August 22

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

POSITIONS VACANT

Research Metallurgist—(Minerals Beneficiation) Required for Island of Cyprus. Metallurgist or Mining Engineer well trained in Metallurgy, with aptitude and interest primarily research. To improve current practice in 100 ton per hour copper flotation mill and test various grades and mixtures of massive sulphide ores. Age to 45. Three year contract. Salary open. Submit complete record and references list with first reply. Cyprus Mines Corporation, 523 West Sixth Street, Los Angeles 14, California.

Assistant Mill Superintendent—Complex lead-zinc 1500-ton selective flotation mill at 13,000 feet in Latin America needs young, alert assistant mill superintendent with BS degree in metallurgy and five years' milling experience, preferably selective flotation. Knowledge Spanish helpful, but not essential. Three-year agreement, liberal vacation allowance; camp isolated, but confortable, congenial. Schooling provided through eighth grade. Opportunity for establishing connection with major metal producer in stimulating position. If interested, send education and experience resume, photograph, and salary desired to: P-8574, Engineering & Mining Journal.

POSITIONS WANTED

Hydraulic Engineer with over 30 years experience in the field, installation, recovery, and management—hydraulic and hydraulic elevating mining equipment. Will go anywhere, salary open. Can take full charge from ground up, married, no family. PW-8568, Engineering & Mining Journal.

Mining Engineer 25 years experience mine development, exploration and operation states and abroad. Supervisory operations or engineering position desired. Employed. PW-8466, Engineering & Mining Journal.

Geologist: B.S. & M.S., veteran, married, 33. Experience: 1½ yrs. geology, 1 yr. surveying. Prefer western U.S. or foreign. Employed. PW-8483, Engineering & Mining Journal.

GRADUATE ENGINEERS WANTED BY OPERATING COMPANY

Must have broad backgrounds and experience in Design and Project Development of Mine Plant, Concentrator, and Smelting & Refining Plants for non-ferrous metals.

Openings are available for outstanding applicants in Design and Project Development Engineering Supervision and for a top Supervisory position in Estimating. These men must know related design and equipment used in other industries.

Salary Open. Pension plans, hospitalization, vacations, and other corporate benefits available. Transportation and moving costs allowed for successful applicants. Must pass physical examination. Age: To 45. Location: Western United States.

Apply, sending detailed personal information to:

P-8489 Engineering & Mining Journal
68 Post St., San Francisco 4, Calif.

TECH. SALES REPRESENTATIVE

Established blasting accessories manufacturer wants to employ mining school graduate who has minimum of five years drilling and blasting experience. Work would be in technical service to customers. Travel involved. Location, New England. Send resume and salary requirements to

RW—8449 Engineering & Mining Journal
Class. Adv. Div., P. O. Box 12, N. Y. 36, N.Y.

Your inquiry will have special value . . .

if you mention this magazine, when writing advertisers. Naturally, the publisher will appreciate it . . . but, more important, it will identify you as one of the men the advertiser wants to reach with this message . . . and help to make possible enlarged future service to you as a reader.

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

BUSINESS OPPORTUNITIES — EQUIPMENT - USED or RESALE

RATES

DISPLAYED

The advertising rate is $16.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns 30 inches—to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

UNDISPLAYED

$1.50 a line, minimum 3 lines. To figure advance payment count 5 average words as a line.

PROPOSALS, $1.50 a line an insertion.

BOX NUMBERS count as one line additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

Send NEW ADS or INQUIRIES to ENGINEERING AND MINING JOURNAL, P. O. Box 12, New York 36, N. Y. for September issue closing August 23

CLASSIFIERS: 2—Akins and two Wemco 78" double pitch, duplex, 36 ft. steel tanks, complete with motor, drive, etc. New 1956. Condition guaranteed. One Dorr 19' x 8' x 37'6" Bowl & Rake Classifier complete with motor and controls. New 1956, condition guaranteed.

HEAVY MEDIA PACKAGE UNIT, semi-portable, bolted construction, capacity 30 TPH, complete with 7 ft. Cone, Densifier, Pumps, Magnetic Separators, Rectifier, Controls, etc. Condition guaranteed.

PULVERIZER: Marcy 8' x 12' Rod Mill, center peripheral discharge complete with 350 H.P. motor, speed reducer, etc. New 1955, condition guaranteed.

DRYERS, KILNS, COOLERS: Two 8' x 124' Kiln, One 9' x 130' Kiln, One 10' x 200' Kiln, One 6' x 50' Kiln. One 6' x 50' Dryer. One 6' x 50' Cooler.

REDUCTION CRUSHERS: Nordberg 4¼ ft. Cone with 200 H.P. motor. Nordberg Gyradisc 54" with 200 H.P. motor.

JAW CRUSHERS: 4" x 8" to 48" x 60".

MINER: Joy continuous Miner model 3 JCM-4, height 34", width 90", capacity 2 to 3 tons per minute, 440 volt A.C. Condition like new.

OVERHEAD ELECTRIC TRAVELING CRANES: One 6 ton, 80 ft. span, and one 10 ton, 80 ft. span; both 4 motor, cage control, bucket operating, 440 volt, A.C. One 25 ton, 56'4" span, 125 volts D.C.

COMPRESSORS: Two Ingersoll Rand 33 x 20½ x 24, 3864 CFM, 100 lbs., 2200 volts.

LOCOMOTIVES: 4—G.E. and G.M. 80 tons and 90 tons, new 1956. Condition like new.

WE BUY AND SELL EQUIPMENT THROUGHOUT NORTH AND CENTRAL AMERICA

A. J. O'NEILL
Lansdowne Theatre Building
Lansdowne, Pa.
Phila. Phones: MAdison 3-8300—3-8301

***New* — Never been used —**

22—3" Steam tubes, 27—4½" Steam tubes, 27—Hangers for a 6'x50' Louisville Steam Tube Dryer

Used

1—Louisville Steam Tube Dryer 6'x50', converted to a cooler
4—Eimco Disk filters—6x6 ft dia.
2—Oliver Drum filters—8'x12' dia.
1—Eimco Drum filters—6' dia—4' face.
Filter covers and bags to fit above—

Can be inspected at

HERSHEY ESTATES
Extraction Division
Hershey, Pa.
(T. R. Banks, Phone Keystone 3-9466)

MINES IN MEXICO

Will rent, sell or consider partnership. Have large tonnage mercury property. Also copper, silver, gold properties. Tax exemptions feasible now more than ever. Full information on request. Capable engineering staff available. Ample references to responsible parties. Ernesto Ancira, Balderas 36, Suite 802. Telephone 215514. Mexico, D. F.

"Opportunity" Advertising
Think
"SEARCHLIGHT"
First

"FASTER FROM FOSTER"
RAIL
& ALL TRACK EQUIPMENT
Nation's Largest Warehouse Stocks

L. B. FOSTER CO.
PITTSBURGH 30 • ATLANTA 8 • NEW YORK 7
CHICAGO 4 • HOUSTON 2 • LOS ANGELES 5

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

BOOK WANTED

Urgently Needed—a copy of A.M. Fairlie's "Sulphuric Acid Production", ACS Monograph No. 69, published by Reinhold Publishing Corp., 1939. Please contact James W. Franklin, Associate Editor, E&MJ.

BUSINESS OPPORTUNITIES

Mexican Mining Properties have several worthwhile properties needing capital to operate. Registered engineer available for mine examination in Mexico. P.O. Box 7006, El Paso, Texas.

Heavy Media Fluorspar Mill, as is, ready for operation—For Rent; Can produce Metallurgical Fluorspar from available ores in area; only experienced Operators should respond. R. A. Browning, Rosiclare, Illinois.

Placer ground one mile lease, Average over $1 per yd. Steel boxes, D 8 Cat, ½ yd shovel, 3 trucks, and camp equipment. Operating now. Injury and illness forces cash sale. First offer over $30,000 takes. Located Yukon District on Shorty Creek. 7 miles from Haines HiWay. Sold by Inspection Only. BO-8408, Engineering & Mining Journal.

An Investment!

Productive advertising is an INVESTMENT rather than an EXPENDITURE. "Searchlight" advertisers almost invariably report prompt and satisfactory results

BE CONVINCED—send us your advertisement TODAY.

Address
Classified Advertising Division
Engineering & Mining Journal
P. O. BOX 12
NEW YORK 36, NEW YORK

SEARCHLIGHT Equipment Spotting Service

This service is aimed at helping you, the reader of "SEARCHLIGHT", to locate Surplus new and used electronic equipment and components *not currently advertised.* (This service is for USER-BUYERS only) No charge or obligation.

How to use: Check the dealer ads to see if what you want is not currently advertised. If not, send us the specifications of the equipment and/or components wanted on the coupon below, or on your own company letterhead to:

Searchlight Equipment Spotting Service
ENGINEERING & MINING JOURNAL
P. O. Box 12, N. Y. 36, N. Y.

Your requirements will be brought promptly to the attention of the equipment dealers advertising in this section. You will receive replies directly from them.

Searchlight Equipment
Spotting Service
c/o ENGINEERING & MINING JOURNAL
P. O. Box 12, N. Y. 36, N. Y.

Please help us locate the following equipment, components:

.....
.....
.....

NAME ..... TITLE .....
COMPANY .....
STREET .....
CITY .... ZONE .... STATE 8/58

MORSE—FOR ALL YOUR EQUIPMENT NEEDS

JAW CRUSHERS
6—2¼" x 3½" New Morse Lab Crushers
6—4" x 6" New Morse Lab Crushers
1—6½" x 7" Hendy Jaw Crusher
1—9" x 16" Day Jaw Crusher
1—8" x 15" Wheeling Jaw Crusher
1—10" x 20" Pacific Jaw Crusher
1—15" x 24" Universal Jaw Crusher
1—9" x 36" Cedar Rapids Jaw Crusher
1—42" x 48" Traylor Jaw Crusher

BALL AND ROD MILLS
1—4' x 4' Marcy Ball Mill
1—6' x 4' Hardinge Conical Ball Mill
1—6' x 6' Allis-Chalmers Ball Mill
1—7' x 5' Allis-Chalmers Ball Mill
1—8' x 22' Hardinge Conical Ball Mill
1—3' x 7' Morse New Rod Mill
1—4' x 10' Hardinge Rod Mill
2—5' x 10' Traylor Rod Mills
1—5' x 10' Hendy Rod Mill

FLOTATION MACHINES
1—#7 Morse "Jetair" Hydra-cell, 22" x 22"
1—4-cell Morse-Weinig, 24" x 24"
1—2-cell Fagergren, 66"
1—4-cell Fagergren, 66"
1—8-cell Fagergren, 56"
1—2-cell Agitair #24
1—Denver unit cell #250
7—2-cell Fagergren, 62"

LOCOMOTIVES—DIESEL
1—2-ton Goodman Diesel, 18" ga.
1—4-ton Goodman Diesel, 18" ga.

LOCOMOTIVES—BATTERY
5—1½-ton Mancha "Little Trammers," 18" ga.
1—1½-ton General Electric Trammer
3—3½-4 ton Mancha Locomotives, Titan "A"
1—4 ton Westinghouse-Baldwin Locomotive
2—6 ton General Electric Locomotives
2—7 ton General Electric Locomotives
1—7 ton Atlas Locomotive
3—8 ton Ironton Locomotives
2—8 ton Goodman Locomotives
2—8 ton General Electric Locomotives
1—9 ton Whitcomb Locomotive
4—10 ton Atlas Locomotives

LOADERS
17—Eimco 12B, 18" ga.
8—Eimco 21, 18" & 24" ga.
3—Gardner-Denver Model 9, 18" ga.
1—Joy HL3, 18" ga.
1—Joy HL20, 24" ga.
2—Hough Payloaders, Rubber Tired, Model HL and Model HF.

AIR SLUSHER HOISTS
4—Ingersoll-Rand Model ASNNOH
1—Joy Model FF211
1—Ingersoll-Rand Model HNN-1J

AIR TUGGER HOISTS
2—Ingersoll-Rand Model D6U
9—Ingersoll-Rand Model EUA
2—Ingersoll-Rand Model 10HR
5—Gardner-Denver Model HK
2—Joy Model F113
3—Ingersoll-Rand Model HU

ELECTRIC TUGGER HOISTS
1—5-HP Sullivan, Single Drum, Model DE
2—7½-HP Sullivan, Single Drum, Model HE
4—5-HP Sullivan, Double Drum, Model HDE
2—15-HP Ingersoll-Rand Model 15NN-1G
2—20-HP Ingersoll-Rand Model 20NM2C
1—50-HP Sullivan Model CF-211

MINE HOISTS— SINGLE DRUM, ELECTRIC
1—10-HP Vulcan #0
1—15-HP Vulcan
1—20-HP H&B
1—25-HP Vulcan #1½
1—30-HP Vulcan #22C
2—40-HP Vulcan
1—50-HP H&B
1—50-HP W. A. Box
1—75-HP Vulcan
2—100-HP W. A. Box
1—112-HP Vulcan
1—150-HP Vulcan
2—150-HP Ottumwa
1—250-HP Ottumwa

MINE HOISTS—DOUBLE DRUM, ELECTRIC
1—75-HP H&B Complete with Steel Headframe
1—75-100-HP, Clutched Drums, Post Brakes
1—82-HP Vulcan #5½
1—100-HP Webster, Clamp & Lane
1—150-HP Jackson

SAND PUMPS
3—1" Deco
1—1½" Kimball-Krogh
2—1½" Galigher, Vac-seal
5—2" Wilfley
1—2" Denver
2—2" A.S.H. Hydroseal
3—2" Galigher, Vac-Seal
4—3" Wilfley
1—3" A.S.H. Hydroseal
2—4" Wilfley
2—4" A.S.H. Hydroseal
1—6" Amsco Dredge Pump

GYRATORY CRUSHERS
1—2' Symons Standard Cone Crusher
1—2'4" Traylor Type TY Gyratory
1—3' Traylor Type TY Gyratory
1—3' Traylor Type T Gyratory

ROLL CRUSHERS
2—16" x 10" McFarlane Crushing Rolls
1—40" x 20" Cedar Rapids Crushing Rolls

PORTABLE COMPRESSORS
1—210 CFM LeRoi Portable Compresser. Gas Engine Driven
1—600 CFM Ingersoll-Rand "Gyrofio" Portable Compressor, Diesel Driven

CONCENTRATING TABLES
10—Deister No. 6 Concentrating Tables

VIBRATING SCREENS:
1—4' x 10' Allis Chalmers Double Deck Screen.
1—3' x 7' Robins Gyrex S.D. Screen
1—4' x 10' Denver Dillon S.D. Screen
1—5' x 10' Denver Dillon S.D. Screen

NOW LIQUIDATING TWO COMPLETE MINING AND MILLING PLANTS OF WAH CHANG MINING CORP. AT BISHOP, CALIF., AND TEMPIUTE, NEVADA. SEND FOR INVENTORY.

MORSE BROS. MACHINERY CO.

EST. 1898

2900 Brighton Blvd. P. O. Box 1708 Keystone 4-5261 DENVER, COLORADO

MINE LOCOMOTIVES

Four—2½ yrs old—complete with btrys
Priced to move fast.
WEISSBUCH STEEL SUPPLY
P. O. Box 629, Gary, Ind.
Phones: TU 5-7555, TU 2-9349

LOCOMOTIVES
BLOWER — DRILLS

Three 80 ton G.E. Diesel-Electric Locomotives. Like new—built 1955. 42" track gauge, will alter to suit.
One Ingersoll-Rand Motor Blower, Type FS—never used.
Four Blast Hole Drills, Bucyrus Erie 42 T Electric, with accessories. In good operating condition.—Bargain price.
1—Joy Axivane Series 1000 Fan, Model 42½-26½ 1150 B.D., 30,000 C. F. M. at 3" W. G. Complete with drive and 25 H.P. Motor, 250 volt, D.C.—Excellent condition.

COALDALE MINING COMPANY, INC.
Lansford, Pennsylvania
Lansford 1619

FOR SALE

CRUSHERS—MILLS
4—Gyratory—K-V-S #49, 38½, 19
1—Cone—Symons 3' Standard
1—Hammermill—Penna. #5060, 400 HP
1—Compeb Mill—Al. Ch. 7' x 24' two compartment
4—Ball Tube Mills—Al. Ch. 5'6" x 22'
2—Ball Mills—Marcy #64½, #66
3—Ball Mills—Hardinge 8 x 36, 8 x 48, 10 x 48
DRYER & KILNS
4—7' x 120'—9/16" shell, brick lined
1—8' x 115'—½" shell, 2 tires
2—8' x 70'—Double shell, indirect heat
1—5'6" x 50'—Structural Steel Base
3—5' x 30'—½" thick shell
2—4'6" x 33'—½" thick shell
1—4' x 24'—Brick lined
PARTIAL LIST
SEND US YOUR INQUIRIES
PERRY EQUIPMENT CORP.
1419 N. 6th St. Phila. 22, Pa.
POplar 3-3505

TO HELP YOU...
find equipment you need
"Searchlight" Advertising

NEW RAIL
20# — 30# — 40#
IN STOCK
LEFTON INDUSTRIAL CORP.
GENERAL OFFICE: 212 Victor St.
St. Louis 4, Mo.

BE WISE—ECONOMIZE
BUY THRU—MACHINERY CENTER, INC.

BLOWERS
6—TM8 Coppus Ventair, 15 HP
2—TM6 Coppus Ventair, 5 HP
6—TM7 Coppus Ventair, 10 HP
1—SP-125 Coppus Vane, Air Drive
1—18" x 27" Roots Blower, 75 HP

BUCKETS
24—26" Pacific Scraper
1—60" Pacific Scraper
106—8" Joy Scraper Sheaves
1—Pacific "Round-the-Corner" Sheaves
1—42" Clemmer Folding Type

CAP LAMPS
165—MSA Type R-Edison w/Charger

CARS, MINE ORE
32—33 cu. ft. Ajax Type Side Dump 18" ga.
36—37½ cu. ft. Ajax Type, Side Dump 18" ga.
13—100 cu. ft. Gable Bottom, 18" ga.
52—18½ cu. ft. End Dump, 18" ga.
11—30 cu. ft. Card Rocker Dump, 24" ga.
10—1 Ton Rocker Dump, 24" ga.
5—85 cu. ft. Card, Granby Type, 30" ga. NEW
23—80 cu. ft. Card, Granby Type, 30" ga.
14—84 cu. ft. Card, Granby Type, 30" ga.
7—100 cu. ft. Card, 30" ga.
14—130 cu. ft. Card Side Dump, 30" ga.
8—93 cu. ft. Card, Granby Type, 24" ga.

COMPRESSORS, AIR
2—2500 CFM Sullivan WN4, 400 HP Motor
1—1000 CFM G-D, HA, 200 HP Motor
1—900 CFM I.R., XRE, 175 HP Motor
1—1500 CFM Worthington, 400 HP Motor
1—2000 CFM Worthington, 400 HP Motor
1—450 CFM C.P. 100 HP Motor
1—350 CFM, I.R., XRB, 75 HP Motor

DIAMOND DRILLS
2—HS-15 Sullivan, Air Powered
1—Longyear, Model UG, Gas Driven

GENERATOR POWER PLANT
1—.60 KW GMC Diesel, 440 volt, Like New
1—300 KW Caterpillar Diesel Generator, 7200 V, Low Hrs.
1—75 KW Cat Diesel Generator, 440 volt

HOIST, MINE SHAFT
1—600 HP Vulcan, Double Drum
1—800 HP Nordberg, Double Drum
1—900 HP Allis Chalmers, Double Drum
1—375 HP W.S.M., Double Drum
1—150 HP W.S.M., Double Drum
1—170 HP Allis Chalmers, Double Drum
1—75 HP Puget Sound, Single Drum
3—75 HP Vulcan, Single Drum

HOISTS, TUGGER & SLUSHERS
1—50MNM4C, I.R., 3 Drum, 440 volt
2—50NM4D, I.R., 2 drum, 440 volt
2—50 HP Sullivan, 2 Drum, 440 volt
1—HDE-2 Sullivan, 2 Drum, 25 HP, 440 volt
27—15NNIG I.R. Slusher, 440 volt
1—A2F211 Joy Slusher, 15 HP, 440 volt

37½ cu. ft. Ajax Type Mine Cars

17—7½ HP Sullivan Slusher, 440 volt
5—HNN1J I.R. Slusher, Air
2—A5NNOH I.R. Slusher, Air
1—D6UL I.R. Tugger, Air
3—HU I.R. Tugger, Air, 2000#
7—HK G.D. Tugger, Air, 2000#

JUMBOS
2—Joy Jumbos DJTA, on track

LOADERS
7—G.D. 9H Mucking Machines, 18" ga.
7—G.D. 9 Mucking Machines, 24" ga.
1—12B Eimco Mucking Machine, 18" ga.

LOCOMOTIVES
10—1½ Ton Mancha, 18"-24" ga. Battery
3—1½ Ton Atlas "Type J", Battery, 18" ga.
1—3 Ton Jeffrey, Battery, 18" ga.
1—7 Ton Plymouth Diesel, 18" ga. Scrubber
1—2 Ton Diesel Locomotive, 18" ga.
6—4 Ton Jeffrey Type Battery, 18" ga.
4—Universal Tramaire, Air, 18"-24" ga.
1—Eimco Air, 24" ga.
1—13 Ton G.E. Trolley, 30" ga.
3—8 Ton G.E. Trolley, 30" ga.

BALL MILLS & ROD MILLS
5—8' x 9' Traylor Ball Mills, 250 HP, 2200 V
1—5' x 8' Traylor Rod Mill, 150 HP, 440 V
1—7' x 6' Allis Chalmers Ball Mill, 250 HP, 440 V
14—8' x 6' Marcy Type Ball Mills, 225 HP, 2200 V
6—6' x 12' Allis Chalmers, Ball-Tube, 150 HP, 2200 V
1—64½ Marcy Ball Mill
1—6' x 4' Denver Ball Mill
1—8' x 48" Hardinge Ball Mill, 225 HP

CLASSIFIERS
2—24" x 13' Wemco Spiral, double pitch, 3 HP
1—45" x 17'3" Akins Spiral, w drive
4—7" x 25'6" Dorr DSFX, Duplex
1—6' x 23'4" Dorr DSF, Duplex
1—5' x 17' Dorr Duplex, 5 HP Motor
1—8' x 28'6" Denver Model D, 10 HP Drive

CONVEYORS
1—24" x 50' Hewitt Robins, Steel Structure
1—18" x 48' Hewitt Robins, Steel Structure
1—18" x 120' Belt Conveyer, 5 HP Drive

CRUSHER
1—15" x 36" Universal Jaw, 50 HP, 440 V
1—36" x 48" Traylor Jaw, 125 HP Motor
2—36" x 48" Birdsboro Buchanan, Jaw
1—8 x 10 Denver Jaw RB, NEW
1—322 Type R, Allis Chalmers, Reduction
1—4¼' Symons, Standard Cone
2—5½' Symons Shorthead, 200 HP Motors
1—15" x 24" Cedar Rapids Crushing Plant on Pneumatic Tires Gas Drive

FEEDERS, ORE
1—36" x 72" Jeffrey Grizzly, 440 V
2—24" x 8' Denver Adj. Stroke w/drive
1—24" x 5' Denver Adj. Stroke w/drive

FLOTATION MACHINE
2—6 Cell No. 18, Denver Sub-A, 28" x 28"
1—4 Cell, 24" x 24" Agi-air, Rubber Covered
4—4 Cell, 58" x 58" Agitair, 10 HP Motor
2—8 Cell, 58" x 58" Fagergren, Level Type
4—2 Cell, 48" x 48" Agitair, 15 HP Motor

JIGS
3—12" x 18" Denver Duplex, Complete
1—42" x 42" Pan American Duplex

MAGNETS
2—Dings Bi-Polar 24" x 30", 230 Volt
1—36" Dings Magnetic Detector
1—24" x 30" Dings Suspended Magnet

PUMPS
2—2"—3" ASH Hydroseal "A" Frame
11—4"—6" ASH Hydroseal "B" Frame
3—6"—8" ASH Hydroseal "C" Frame
11—4" Wemco Torque Flow Solids, 15 HP
1—3" Wemco Torque Flow Solids, 15 HP
1—2" Gallagher Vaseal, 5 HP
2—1" Willey, Acid, 5 HP Motor

FILTERS
1—4'—1 Leaf Eimco, complete
2—3' x 4' Oliver Drum, complete
1—6'—5 leaf Oliver Disc Type
1—6' 6 leaf Oliver, Disc Type
1—6' x 6' Oliver, Stainless Steel

MILL-MOBIL
1—No. 2 Wemco (HMS) Mobil Mill Complete and ready for operation.

SCREEN
2—4' x 8' Symons Rod Deck
1—3' x 6' Symons Rod Deck
1—30" x 10' Dillon, 2 Deck, 3 HP
1—4' x 5' Oversirom, 1 Deck, 2 HP

THICKENERS
2—20' x 8' Wemco Steel Tanks
1—38½' x 8' Denver
1—21½' x 8' Denver

THIS IS ONLY A PARTIAL LISTING OF EQUIPMENT FOR SALE
ASSAY EQUIPMENT, ELECTRICAL AND SHOP EQUIPMENT ARE AVAILABLE

MACHINERY CENTER, INC.

1201 SOUTH 6TH WEST, P. O. BOX 964 SALT LAKE CITY, UTAH, TEL. HUnter 4-7601

When you need...

LOW COST—DEPENDABLE
INDUSTRIAL RUBBER PRODUCTS

call **CARLYLE**

FOR ALL YOUR REQUIREMENTS OF

RUBBER HOSE

Air	Discharge	Suction
Acid	Fire	Water
Paint Spray	Fuel Oil	Steam
Solvent	Oil Suction	Vacuum
Welding	& Discharge	Pneumatic
Pile Driver	Gasoline	Road Builders

BELTING

Conveyor Grader Hot Material V-Belts
Elevator Chute Lining Mucker Transmission

PROMPT SHIPMENTS LOW COST QUALITY PRODUCTS

CARLYLE RUBBER CO., INC.
103-107 Warren St., New York 7, N. Y. - Digby9-3810

PROFIT SHARING

Ingersoll-Rand Drifters
Model DA35

22 Drills in running condition.
At our low low price you can afford to buy for parts.

$350.00 each FOB Portland, Oregon

Wire—Write—Phone
GEORGE M. PHILPOTT CO., INC.
1060 BRYANT STREET
SAN FRANCISCO, CALIF.
Tel.: HEmlock 1-5475

7½ ton & 15 ton lime hydrating plants

CRUSHERS:
1—24" x 36", 18" x 36", 12" x 24" Jaw Crusher #332 A-C Hydro-Cone.
2—42" x 16" Allis-Chalmers Crushing Rolls 36" x 16" rebuilt Sturtevant rolls
1—24" x 12" Farrell Bacon Crushing Rolls 28" Telesmith Intercom Crusher 6", 10", 20" McCully Super Gyratory Crushers No. 3 up to No. 12 Gyratory Crushers
1—#1 Raymond Mill

BALL & TUBE MILLS:
2—5½' x 20' & 6' x 22' & 7' x 24' Tube Mills

W. P. HEINEKEN, INC.
50 Broad St., WH 4-4236 NEW YORK 4, N. Y.

ADVERTISERS IN THIS ISSUE

***Indicates more product information may be found in company advertising appearing in E&MJ 1958 Mid-June Mining Guidebook and Buying Directory Issue. Check your Guidebook Index.**

*Allen-Sherman-Hoff Pump Co. ..... Second Cover
Allis-Chalmers Mfg. Co. (General Products Div.) 143
Allis-Chalmers Mfg. Co. (Industrial Equipment Div.) 38–39, 162
Allis-Chalmers Construction Machinery Div. 66–67, 74–75
*American Brass Co., American Metal Hose Div. 70–71
*American Brattice Cloth Corp. 220
*American Cyanamid Co. Insert between pp. 62–65
*American Cyanamid Co., Explosives & Mining Chemicals Dept. 73
American Manganese Steel Div., American Brake Shoe Co. 182
*American Mine Door Co. 167
*American Smelting & Refining Co. 57
American Steel & Wire Div. 78
*Asea Electric, Inc. 36
Athey Products Corp. 140–141
Atlas Car & Mfg. Co. 212
Atlas Powder Co. 65

*Babcock & Wilcox Co. 213
Barber-Greene Co. 153
Bemis Bro. Bag Co. 148
Bethlehem Steel Co. 165, 179
Birdsboro Steel Foundry & Machine Co. 223
Blaw-Knox Co. 52, 167
Boston Woven Hose & Rubber Co. 48
Broderick & Bascom Rope Co. 133
*Brunner & Lay, Inc. 204
Bucyrus-Erie Co. 11
Bush Engrg. & Mfg. Co. 216

Calvert School 222
*Card Iron Works, C. S. 180
Caterpillar Tractor Co. 5, 28–29, 124–125, 232
Chicago Pneumatic Tool Co. 26–27
*Christensen Diamond Products 144
*Colorado Fuel & Iron Co. 68
Colorado Iron Works Co. 171
*Connellsville Mfg. & Mine Supply Co. 196
*Coppus Engrg. Corp. 135
Crane Co. 195

DeZurik Corp. 216
Deister Concentrator Co. 138
Deister Machine Co. 224
*Denver Equipment Co. 121
Detroit Diesel Engine Div., General Motors Corp. 175
*Diamond Drill Contracting Co. 206
Differential Steel Car Co. 198
Dorr-Oliver, Inc. 8–9
Dow Chemical Co. 58–59
Dravo Corp. 224
duPont de Nemours & Co., E. I., Expl. Dept. 225

*Eimco Corp. 40
*Elektrokemish, A.S. 208
Ellicott Machine Corp. 218
*Ensign-Bickford Co. 47
Euclid Div., General Motors 72
*Exide Industrial Div, Electric Storage Battery Co. 172

Fairbanks-Morse & Co. 185
*Falk Corp. 149
Flexible Steel Lacing Co. 214
Ford Motor Co., Truck Div. 128–129

*Galigher Co. 193
General American Transportation Corp. 199
General Electric Co. 60
General Tire & Rubber Co. 61
Georgia Iron Works Co. 155
*Godoy & Co., E. A. 188
Goodrich Industrial Products Co., B. F. 3
Goodrich Tire Co., B. F., Div. of B. F. Goodrich Co. 161

*Harbison-Walker Refractories Co. 50–51
*Hardinge Co. 174
*Harnischfeger Corp. 12–13
*Hercules Powder Co. 10
*Hewitt-Robins 178
Huber-Warco Co. 157, 159

*Industrial Physics & Electronics Co. 220
Infilco, Inc. 194
*Ingersoll-Rand 1, 76–77
International Harvester Co. 53, 54–55, 56
International Nickel Co. 62
*Isbell Construction Co. 190

Jenkins Bros. 119
Johnson Aircraft Co., M. J. 170
Joy Mfg. Co. 212

Kaiser Engineers Div., Henry J. Kaiser Co. 79
*KW-Dart Truck Co. 211
Kennedy-VanSaun Mfg. & Engrg. Corp. 181
*Kern Instruments, Inc. 222
Koehring Div. of Koehring Co. 14–15

Lawrence Pumps, Inc. 152
LeRoi Div., Westinghouse Air Brake Co. 177
*LeTourneau-Westinghouse Co. 32–33, 35, 37
Lectromelt Furnace Div., McGraw-Edison Co. 205
Lima Works, Construction Equipment Div., Baldwin-Lima-Hamilton Corp. 210
*Link-Belt Co. 173
Lubriplate Div., Fiske Bros. Refining Co. 218
Lukens Steel Co. 197

*Mack Trucks, Inc. 217
Mancha Storage Battery Locomotive Div., Goodman Mfg. Co. 16
Marion Power Shovel Co., A. Division of Universal Marion Corp. 207
McLanahan & Stone Corp. 146
Michigan Chemical Corp. 206
*Mine Safety Appliances Co. 69
*Mine & Smelter Supply Co. 156
Minneapolis-Honeywell 169
Mixing Equipment Co., Inc. 176

*Naylor Pipe Co. 191
New York Engineering Co. 224
*Nordberg Mfg. Co. 189

Ohio Brass Co. 25

Permutit Co. 219
Phelps Dodge Refining Corp. 200
Philadelphia Gear Corp. 201
Porter Co., Inc., H. K., Leschen Wire Rope Div. 184

Republic Steel Corp. 150–151
*Riblet Tramway Co. 222
Ridge Tool Co. 164
Rockiron Co. 188
Roebling's Sons Corp., John A. 192

*Sauerman Bros., Inc. 154
Searchlight Section 226–230
Shaft Constructors, Inc. 214
Shaft & Development Machines 218
*Simplex Wire & Cable Co. 31
Sly Mfg. Co., W. W. 166
*Smidth & Co., F. L. 131
*Sprague & Henwood, Inc. 208
*Standard Oil Co. of California 49
*Stearns Magnetic Products, A Div. of The Indiana Steel Products Co. 186
Stoody Co. 209
Straub Mfg. Co. 183
Sturtevant Mill Co. 214
Sun Ship Building & Drydock Co. 64

Taylor-Wharton Co., Div. of Harsco Corp. 30
*Texas Co. 6–7
Thermoid Co. 163
Thew Shovel Co. 203
Timken Roller Bearing Co. ..... 34, Fourth Cover
*Traylor Engrg. & Mfg. Co. 187

United States Rubber Co., (Mech. Goods Div.) 117
United States Rubber Co., (Tire Div.) 145
*United States Steel Corp. 158, 215

*Vulcan Iron Works Co. 160

Walworth Co. 221
Wedge-Wire Corp. 142
West End Chemical Co. 147
*Western Machinery Co. 137
*Western Rock Bit Mfg. Co. 168
Wheel Trueing Tool Co. ..... Third Cover
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp. 139
*Wilfley & Sons Co., A. R. 80
*Winter-Weiss Co. 202

Yuba Mining Div., Yuba Consolidated Industries, Inc. 122

CLASSIFIED ADVERTISING
F. J. Eberle, Business Mgr.

PROFESSIONAL SERVICES 226–227
EMPLOYMENT OPPORTUNITIES 227
EQUIPMENT (Used or Surplus New) For Sale 228–230

ADVERTISING SALES STAFF

Atlanta 3 ..... M. H. Miller, 1301 Rhodes-Haverty Bldg., Jackson 3-6951
Chicago 11 .. G. A. Mack, F. W. Roets, 520 N. Michigan Ave., Mohawk 4-5800
Cleveland 13 ..... J. E. Lange, Illuminating Bldg., 55 Public Square, Superior 1-7000
Dallas 1 .... F. E. Holland, 1712 Commerce St., Riverside 7-5117
Denver 2 ..... J. W. Patten, Mile High Center, 1740 Broadway, ALpine 5-2981
Los Angeles 17 ..J. B. Uphoff, 1125 W. 6th St., Huntley 2-5450
New York 36 .. H. C. Chellson, R. W. Peckham, 500 5th Ave., Oxford 5-5959
Pittsburgh 22 ..... Wm. H. H. Ginder, 1111 Oliver Bldg., Atlantic 1-4705
Philadelphia 3 ..... J. B. Lewis, 6 Penn Center Plaza, Locust 8-4330
St. Louis 8 ..... F. W. Roets, Continental Bldg., 3615 Olive St., Jefferson 5-4867
San Francisco 4 ..... J. W. Otterson, 68 Post St., Douglas 2-4600
GREAT BRITAIN .... McGraw-Hill House, 95 Farrington St., London, E.C. 4
EUROPE ..... Michael R. Zeynel, 15, Landgraf - Wilhelm Frankfurt/Main, Germany

LONGER, MORE PROFITABLE ROLLER LIFE—THE RESULT OF CONTINUOUS IMPROVEMENT OF CATERPILLAR PARTS

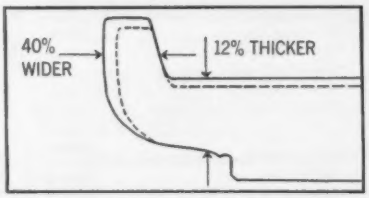
Cat "500" Track Rollers for D8s now have increased rim size for greater strength

A ceaseless search for ways to improve parts performance goes on at Caterpillar. Engineers are constantly striving to make each machine part do its job better, longer and more economically. The payoff for the customer is the steadily improving performance of Cat machines on the job.

New "500" Track Rollers for Cat D8 Tractors, for example, have been redesigned to better resist wear and breakage on the tough jobs. The roller rim has been thickened 12% in its critical area; the flange is 40% wider. The new design prevents roll-over and bending of the outer flange under severe side hill loads.

All Cat roller rims are designed so that treads and flanges may be economically rebuilt by automatic welding—a feature which results in big savings over the life of a tractor.

But that's only part of the story. Matchless Caterpillar quality starts with selection of steel. Extensive testing in Caterpillar metallurgical laboratories eliminates all but the finest quality steel *before* roller manufacturing begins. Further tests (61 in all) are made at every stage of production.



ADDITIONAL MATERIAL on new D8 roller rim is shown by dotted line, above. Thicker, stronger flanges give greater wear resistance and a longer productive life.

Cat roller rims are made from forgings to insure maximum strength and uniformity. They are bored and given a controlled heat treatment producing thick, file-hard wear surfaces; the remainder is left tough to resist shock damage.

These rims are shrunk onto cast-iron hubs of high compressive strength and then center welded. This prevents bore distortion and separation. Automatic precision machines finish-bore the roller assemblies. Careful inspection guarantees uniform quality.

Similar Caterpillar quality is built into track roller bearings and shafts, too. A special bronze alloy is used in Cat bearings to support extra-heavy loads. A cast-iron bushing with high compressive strength encloses the bearing.

There is only one way to get maximum production—the production you paid for—from your equipment. Keep your big, yellow machines on the job by using only constantly improved genuine Cat parts. Your Caterpillar Dealer has full information about the new Cat "500" Track Rollers and all the other quality Caterpillar parts. See him today.

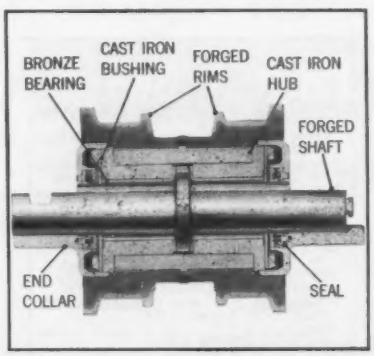
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

SERVICE TIP

Ask your Caterpillar Dealer about the additional economies provided by 500-hour lubrication periods.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



ROLLER CROSS SECTION of Cat "500" Track Roller shows rugged construction. Roller shafts are forged for controlled grain structure, maximum toughness and to permit superior heat treatment. Wear surfaces are hardened to a depth of at least 3/32", leaving a tough, strong core.

TOUGH JOBS, like the one pictured above, play havoc with any but the best track rollers. Here's what happened on an actual job: New Cat rollers were installed on the right side of a tractor; another brand of rollers on the left side. After 668 work hours, seals and bearings of two of the other brand rollers failed. They broke up and were lost from the roller shell. The Cat rollers showed normal wear and the 500-hour lubrication proved its value. Owners everywhere are proving that it pays to standardize on Caterpillar—equipment *and* parts.

Nobody Buys a Hole in the Ground

What you pay for is information, and information comes in the form of core—that wonderful petrified record of what the ages have left below the overburden.

And, when it comes to telling the truth, the whole truth and nothing but the truth, few of the world's records are so perfect and so available as core. Anywhere in the world, drive a coring bit into the earth's crust and nature pours forth her secrets, foot after foot, mile after mile, and—fact after fact. Sometimes the facts may be disconcerting to the theorists but, who can argue with facts preserved in rock and presented in a continuous stretch of core!

Before the diamond coring bit, geologists would piece together the story from chips flushed out with the sludge. Often, it was desperately slow and painfully expensive but was the best way available.

Diamond bits changed all that. Diamond bits not only cut down through tough formations with unbelievable speed and determination but, they did something that never had been done before—they delivered complete cores in which geologists could read the story for thousands of feet without the risk of missing some crucial section which might hold the secret that everybody was looking for.

Nowadays, most drillers know that for fast penetration, longer footage and 100% core recovery, you just can't beat Truco bits.

And Truco bits keep on proving it every day.

TRUCO DIAMOND BITS *by*

WHEEL TRUEING TOOL COMPANY

3200 W. Davison Avenue, Detroit 38, Michigan

WHEEL TRUEING TOOL CO. OF CANADA, LTD.
575 Langlois Avenue, Windsor, Ont., Canada

MEMBER Diamond Core Drill Manufacturers Association

A smart hunter knows this sign means deer...

A smart bearing buyer knows this sign means value...

TIMKEN®

SMART bearing buyers know the trade-mark "Timken" on a product means they get the greatest value for their money. It's a registered trade-mark identifying tapered roller bearings, fine alloy steel bars, seamless steel tubing and removable rock bits, products that are made by The Timken Roller Bearing Company.

And the name "Timken" stands for highest quality. Quality that industry knows and wants. Quality with a backing of 59 years' experience, safeguarded at every step from melt of steel to finished product.

It will pay you to remember that "Timken" is a trade-mark, not just a type of product. If you're looking for the best, look for the trade-mark "Timken". It's your assurance of getting the highest value. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TAPERED ROLLER BEARINGS • REMOVABLE ROCK BITS • FINE ALLOY STEEL